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ABSTRACT

Presented is a curriculum designed to provide the teacher of the young deaf child with learning disabilities with a description of developmental objectives and methods for fulfilling these objectives in the areas of gross motor development, sensory motor integration, visual analysis, attention and memory, and conceptualization. The objectives are based on assumptions such as, the deaf child with learning disabilities moves through stages of physical and cognitive development in the same sequence as normal children. Information in each of the five instructional areas consist of a sequence of broad instructional objectives and subordinate specific objectives defined in terms of the child's behavior, with activities and materials intended to help the child master the objectives included under the subordinate objective. The curriculum is arranged in an hierarchical manner, since the authors believe that the earliest levels of gross motor coordination need to be mastered before the finer skills of sensory motor integration can be performed successfully. Pictures and diagrams accompany the curriculum. (For related documents see also EC 041 647-9.) (CB)

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THE STATE EDUCATION DEPARTMENT
BUREAU FOR PHYSICALLY HANDICAPPED

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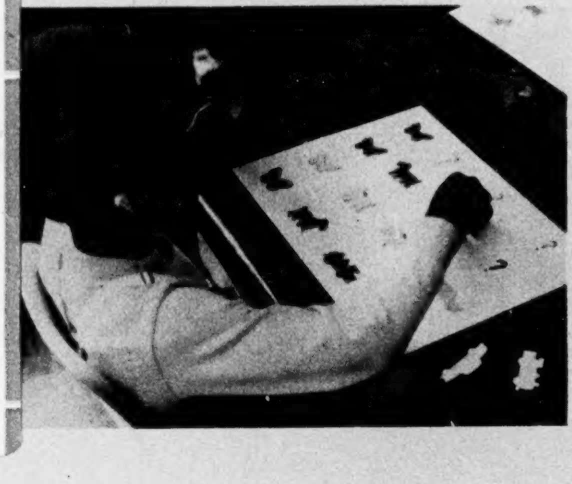

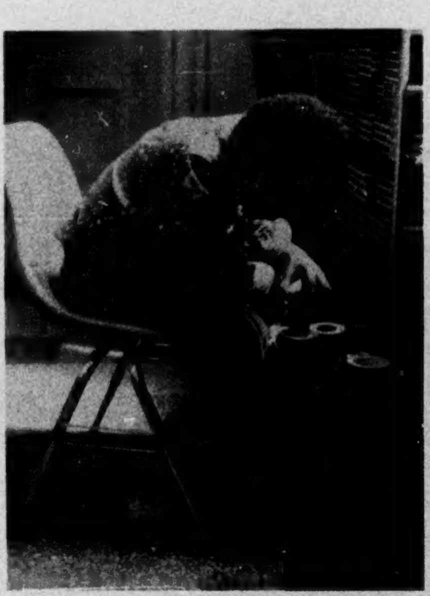

CURRICULUM FOR YOUNG DEAF CHILDREN

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PROJECT CREED 5 1971

cooperative research endeavors in education of deaf
funded by P.L. 89-313
Elementary-Secondary Education Act Title I

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CURRICULUM FOR YOUNG DEAF CHILDREN

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Project CREED 5
1971

Cooperative Research Endeavors in Education of Deaf

Administrator: Frances Cronin, Superintendent
St. Joseph's School for the Deaf

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Cleary School for the Deaf
Lake Ronkonkoma, New York

Lexington School for the Deaf
Jackson Heights, New York

Mill Neck Manor Lutheran School for the Deaf
Mill Neck, New York

Caritas Day School for the Deaf
Rockville Centre, New York

New York School for the Deaf
White Plains, New York

New York State School for the Deaf
Rome, New York

Rochester School for the Deaf
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St. Francis de Sales School for the Deaf
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This volume represents the end product of a plan formulated in the fall of 1965 shortly after the enactment of P.L. 89-313, the Elementary-Secondary Education Act. At that time the heads of the various state-supported private schools for the deaf determined to designate a portion of their alloted funds to a cooperative endeavor in the interests of multiply-handicapped young deaf pupils in our schools. The initial stage of this decision was designed as a survey to identify these pupils within their class settings; later stages moved into their assessment as preliminary to development of this curriculum as explained elsewhere.*

In the course of the next several months various stages of CREED - Cooperative Research Endeavors in Education of the Deaf - were outlined. Since then, large numbers of pupils, teachers and aides in each of the schools - with their educational supervisors - have earned our gratitude. Without them this curriculum could not have been constructed.

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*CREED 4 and 5 - Curriculum Development for Young Deaf Children With Specific Learning Disabilities

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Frances Cronin
Administrator, Project CREED

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CREED 5 CURRICULUM

Introduction

Lillian C. R. Restaino, Ph.D., Director

Introduction

The CREED 5 Curriculum is the culmination of a five-year project to develop new alternatives for the education of the young deaf child with special learning disabilities -- the child who has, in addition to his deafness, further problems hindering his progress in school learning. The instructional areas of concern were defined in the early phases of the project by the teachers and supervisors of schools for the deaf in New York State. They recommended that the CREED Project be directed to the areas of *gross-motor coordination*, *sensory-motor integration*, *visual analysis*, *attention and memory*, and *conceptualization*. In order to insure that the most recent knowledge and accomplishments in education and psychology would be made available for the benefit of these children, educational specialists were made responsible for the construction of each of the five areas. The value of a curriculum, however, is measured by the success of its accommodation between theory and practice; it must be both *useful* and *usable*. It was the goal of the principal investigator, therefore, to direct the efforts of the CREED staff so that they represented integrity to the principles of perceptual psychology, developmental psychology and educational psychology within a structure of practical value to the classroom situation.

A. Foundations. While the phases preceding the completion of this curriculum have varied from the descriptive measurement of the target population to specific remedial instruction, the direction for all the elements of the program has come from certain basic principles of human development and learning.

The principle considered most critical to the construction of the curriculum is that, given appropriate environmental opportunities, all human beings progress through developmental processes in essentially similar ways. Because we believe that the sequence of development as described by Piaget and his students is far more productive for the school learning situation than any other description extant, this curriculum is based upon Piagetian principles of cognitive development. The needs of our children demand, in addition, precisely articulated principles of attention and memory; we sought these in the work of contemporary perceptual psychologists such as Kintsch (1970) and Gibson (1969).

Thus, developmental and perceptual psychology provided the basis for the content of the curriculum; learning theory provided the basis for the structure of the curriculum. In our design we hoped to provide appropriate experiences in the classroom for perceptual-cognitive development. To achieve this goal we decided that the theories of Benjamin Bloom (1971) and Robert Gagne (1970) would be most useful. Our attempt at ordering objectives and activities along increasing levels of difficulty is directly related to the systems developed by these and other psychologists in the area of the sequential development of behavioral objectives.

The implementation of aspects from both Piagetian theory and learning theorists in the curriculum may appear a strange combination; indeed, Lee Shulman describes a basic contradiction between the "camps":

> "[The latter point] reflects Piaget's influence on some current conceptions of readiness. To determine whether a child is ready to learn a particular concept or principle, one analyzes the structure of that to be taught and compares it with what is already known about the cognitive structure of the child of that age. If the two structures are consonant, the new concept or principle can be taught; if they are

> dissonant, it cannot. One must then, if the dissonance is substantial, wait for further maturation to take place. If the degree of dissonance is minimal, there is nothing in Piaget's general theory to preclude the introduction of training procedures to achieve the desired state of readiness. However, Piaget seems to prefer the 'waiting' to the 'training' strategy under such conditions. Though his theory admits of both external and internal sources of developmental change, he seems to favor internal ontogenetic mechanisms." (Shulman, 1970, p.43-44)

Piaget, in his chapter in Carmichael's Manual of Child Psychology (Mussen, 1970), makes very clear statements about the nature of experience that will affect the child's development.

> "[If we accept this definition of learning,] the question arises whether development is merely a succession of learned acquisitions, or whether learning and development constitute two distinct and separate sources of knowledge. Finally, there is, of course, the possibility that every acquisition through learning in fact represents only a sector or a phase of development itself, arbitrarily provided by the environment but remaining subject to the general constraints of the current developmental stage." p. 713.

> "Thus, the effects of maturation consist essentially of opening new possibilities for development, that is, giving access to structures which could not be evolved before these possibilities were offered. But between possibility and actualization, there must intervene a set of other factors such as exercise, experience and social interaction." p. 720.

> "Remember also that each time one prematurely teaches a child something he could have discovered for himself, that child is kept from inventing it and consequently from understanding it completely. This obviously does not mean the teacher should not devise experimental situations to facilitate the pupil's invention." p. 715.

> "It would, therefore, be a mistake to consider the succession of these stages as the result of innate predetermination, because there is continual construction of novelty during the whole sequence. The two best proofs of this last point are the possibilities of deviations from the norm and of the variations in the time tally with the possibility of accelerations or delays. Deviations may be brought about by unforeseen experiences encountered by the child himself as well as by adult pedagogical interventions. Some pedagogical intervention can, of course, accelerate and complete spontaneous development; but they cannot change the order of the construction." p. 712.

> "For a specific subject the speed of transition from one stage to the following one has an optimal rate. That is, the stability and even the fruitfulness of a new organization (or structurization) depends on connections which cannot be instantaneous, but cannot be indefinitely postponed either since they would then lose their power of internal combination." p. 713.

It would seem that while clearly rejecting the learning theorists \"cumulative acquisitions" as a definition of development, Piaget is not quite the "passive-ist" that Shulman describes. Thus, while the theoretical foundations of the two "camps" are polarized, many of their principles can be quite successfully applied simultaneously.

Indeed, it has been our experience that these two sources are not incompatible. Describing a sequence of development in terms of the expected behavior of the child need not require that one adhere to the tenets of behavior theory. Kamii, who has developed an exciting pre-school curriculum in Ypsilanti, Michigan, describes the structure of the program in terms of ordered objectives. In explication of this structure, she states:

> "From Piaget's descriptive theory, some people draw the implication that development is a process of 'unfolding' and that all the teacher can do is wait for this unfolding to take place. At the opposite extreme, others feel that whatever Piaget says a 4-year old cannot do can be taught with explanations, repetitions, suggestions, and even operant conditioning. The Piaget-based pre-school curriculum in Ypsilanti, Michigan, works on the belief that the child should be helped to construct certain pre-requisite abilities, but these abilities should not be imposed by the teacher." (Kamii, 1971, p.298)

While it is, of course, quite possible that providing the teacher with specific descriptions of activities may well result in her slavish, lock-step implementation of them, nevertheless we believe that this need not be an inevitable end product. It is the expectation of those who developed this curriculum that the teacher will be knowledgeable about general trends in child growth and development and about individual differences of children within these trends. In other words, the teacher will be completely familiar with the expectations for a child as he moves through certain sequences of development; she will be equally familiar with the wide range in the *time* which individual children take to move through these sequences of development and the ease with which they do so. With such understanding, it is our expectation that the teacher will observe each child carefully and intensively, and that she will then select those objectives and activities appropriate to his level of development. It is our hope that she will use the CREED 5 Curriculum in the manner in which J. McVickers Hunt recommended:

> "If encountering a given set of circumstances is to induce psychological development in the child, these circumstances must have an appropriate relationship to the information already accumulated in the child's mental storage from his previous encounters with circumstances. The problem of presenting particular children with circumstances which will foster their particular development is no easy matter. On the cognitive side, the circumstances presented must be relevant to the information accrued among the child's central brain processes from circumstances encountered in the past. Ordinarily, the best indicators of an appropriate match are to be found, as I now believe, in emotional behavior. These indicators are evidences of interest and mild surprise. If the circumstances are too simple and too familiar, the child will fail to develop and he is likely to withdraw in boredom. If the circumstances presented demand too much of a child, he will withdraw in fear or explode in anger." (Hunt, 1969, p. 129)

The curriculum then becomes a RESOURCE for the teacher, from which she selects objectives and activities for her children, considering their current level of development, her aims for their future progress, and the kinds of experiences that are appropriate for the fulfillment of these aims.

Throughout the ongoing CREED Project, our primary goal has been the development of *cognitive* processes in the child; the content of the CREED 5 Curriculum is, indeed, perceptual-cognitive. We have always been aware, however, of the *affective* needs of our children.

We selected the structure of our Curriculum precisely for the purpose of providing children who have failed over and over again with opportunities for success. Our decision to design sequences of behavioral objectives along increasing levels of difficulty was dictated not by current fashion, but by our recognition of the need to provide for the motivation of the children served by our Curriculum as well as for their perceptual-cognitive development. The sequences are designed so that they begin with very simple objectives and activities, and progress slowly to more difficult levels. The teacher can select a level at which she knows the child will succeed, and work with him through the sequence of objectives. In addition, an attempt has been made to provide several activities for the fulfillment of each objective, so that the child will be given the opportunity to work at different tasks in mastering the objective. In other words, we have attempted to motivate the child through designing a structure that will provide him with opportunities to demonstrate competence. We agree with Hunt (1969) and Gordon (1969) that competence in performance is a strong force for self-motivation. Unfortunately, we know the corollary is true, viz., that failure in performance is a strong force for the child to avoid further attempts. Thus, while we have designed no objectives or activities specific to the encouragement of achievement motivation, we believe that the hierarchy of objectives and the variation of the activities for the mastery of each objective should provide the teacher with numerous opportunities for building a positive self-image of competence in her children.

We present the CREED 5 Curriculum, then, as a resource for the encouragement of a positive self-concept, through development of perceptual-cognitive skills.

B. Classroom Trial.

Unfortunately, a sound foundation in education and developmental psychology alone does not insure the success of a curriculum. Psychologists involved in curriculum design very often forget that the success of the end product is a direct function of the nature of the teacher's involvement in it. Thus, a curriculum must be designed with both a psychologically sound and an educationally practicable structure. Toward this end, the CREED 5 Curriculum was subjected at all stages of its development to evaluation by teachers and supervisors from twelve schools for the deaf in New York State. While the CREED 5 staff designed the objectives, bi-monthly seminars of teachers and supervisors were held for the evaluation and modification of these objectives. When activities for the mastery of the revised objectives were being designed, the participants of these seminars were encouraged to provide appropriate activities from their experience.

When the first draft of the Curriculum was completed, fifty-five teachers in ten schools for the deaf subjected different parts of it to trial and evaluation in their classrooms. Their recommendations and modifications were carefully considered by the CREED staff and implemented in the final draft.

The CREED 5 Curriculum then, is the final product of the collaboration between the CREED 5 staff of educational psychologists, developmental psychologists, specialists in special education, and teachers and supervisors of deaf children with special learning disabilities.

C. Recommendations for Implementation.

We stated that we have attempted to make the CREED 5 Curriculum psychologically sound and educationally practicable; unfortunately, it is only potentially so. We believe that the optimal fulfillment of the goals of the CREED 5 Curriculum is dependent upon the concomitant implementation of three elements of instruction and supervision:

1. the active involvement of para-professionals in the instruction of children.
2. the continuous, ongoing planning and evaluation of instructional programs for children through the cooperation, collaboration and interaction of a team consisting of teachers, para-professionals and supervisors.
3. the individualization of instruction through the systematic observation of the child's performance, diagnosis of his progress, and the development of experiences appropriate to his needs.

1. The active involvement of para-professionals in the instruction of children.

Ten years ago, the introduction of assistants for classroom teachers would have been opposed as strongly by the teachers themselves as by their administrators. Although economic considerations dictated their entrance into education, both teachers and administrators now fully appreciate the importance of the role of the para-professional to the functioning of the school, the class, the teacher and the child. The teacher aide, when her services are used appropriately, can help the teacher transform a classroom from a place where children lose their unique identity, where objectives appropriate to their individual abilities and disabilities are subordinated to objectives appropriate to a conglomerate group, to a place where each child's singular profile of strengths and weaknesses is carefully considered, where instructional objectives are designed to meet his specific needs. If we genuinely accept the philosophy of individual differences, then we must accept the responsibility for selecting individual programs of instruction to meet the needs dictated by such differences. To expect that one teacher will be able to individualize instruction for a group of children is, at best, misinformed; at worst, it is courting failure for both teacher and child.

We are aware that the CREED 5 Curriculum can be used in ways other than as a resource for the selection and design of individual programs of instruction; it is our belief that for the optimal education of the children for whom it was constructed, however, the objectives and activities must be matched to the levels and needs of individuals. We consider that the active involvement of teacher aides in the implementation of the CREED 5 Curriculum will be a basic feature in its success.

2. The continuous, ongoing planning and evaluation of instructional programs through the cooperation, collaboration and interaction of a team consisting of teachers, para-professionals and supervisors.

It has become increasingly clear that no instructional program, including the CREED 5 Curriculum, can be successfully implemented by a teacher in isolation of her colleagues. If one studies carefully the successful team teaching and open classroom approaches, one becomes immediately aware of the systematic and intensive interaction of all teachers and supervisors involved in these programs. While the mythology of the inviolability of the teacher and her class behind the closed door dies hard, once teachers and supervisors experience the support, the insight, and the professional growth produced through such interaction, they are unwilling to function without it.

It should be apparent that the seminars described here are something other than the traditional "grade-level" meetings, at which the supervisors dictate and their teachers listen with varying degrees of apathy and hostility. To be of any value, these seminars must be genuinely collaborative, with teacher, teacher-aides, and supervisors all encouraged to consider and solve the problems generated by the implementation of the new program. The tasks of such seminars may range from the consideration of a new book in child development helpful to the appropriate implementation of the program, to the selection from the program of a set of objectives and activities to meet the disabilities of an individual child as determined by the observations of his teacher, teacher-aide and their supervisors.

These seminars are not the impracticable idea of an educational psychologist musing in the confines of her ivory tower. Early in the trial phase of the CREED 5 Curriculum project, the participating teachers and supervisors recognized the need for such meetings independent of any recommendation by members of the CREED 5 Curriculum staff. We believe that systematic consideration of all phases of the implementation of the CREED 5 Curriculum through the cooperative interaction of all those involved in it will be a basic feature to its success.

3. The individualization of instruction through the systematic observation of the child's performance, the diagnosis of his abilities and disabilities, and the development of experiences appropriate to his needs.

This recommendation is placed last because we believe that the processes described here provide the content to be considered by school personnel through the structures outlined in the first two recommendations.

The CREED 5 Curriculum is the culmination of a project directed toward the improvement of the education of the young deaf child with special learning disabilities. Unfortunately, the construction and dissemination of a curriculum, however superior, does not insure its impact on the well-being of an individual child. The way in which it is implemented in the life space of the child determines the level of its effectiveness in changing the history of his education. Again, we are well aware that the CREED 5 Curriculum will be implemented in ways other than those we recommend; some may improve upon our recommendations, some may well be inimical to the expectations and goals we have set for the children served.

(a) We believe that teaching must be a process of hypothesis derivation and hypothesis testing. These decision-making responsibilities must be assumed, however, on the basis of hypotheses generated from observation of the child's behavior, diagnosis of his disabilities and abilities, and selection of objectives and activities to meet his needs. Thus, the teacher makes decisions about the child at each step of this three step process -- and each step is crucial to the optimal education of the child.

(b) The first of the three -- observation of the individual child's behavior in a variation of activities -- is basic to the others. Unfortunately, few teachers design opportunities in their school day for such observation; yet, without direct observation of the child as he performs tasks demanding different abilities, the teacher instructs him with only a minimal amount of the information necessary. During the three and a half years of the CREED project, teachers repeated again and again that their expectations for their children's performance on testing tasks and curriculum tasks were, in many cases, not fulfilled. In some cases, the child's performance far exceeded the teacher's expectations; she had no idea that he was capable of succeeding on such tasks. On the other hand, some teachers over-estimated a child's ability, finding that he failed repeatedly on tasks the teachers had assumed were within his repertoire of skills. In either case, the teacher's assumptions and presumptions would have resulted in the development of "mis-matched" educational experiences for the child.

Careful observation of the child in all stages of his attempts to master a task can provide a wealth of information for the teacher's future use in developing instructional experiences. Educational psychologists specializing in all areas of instruction -- reading, mathematics, psycholinguistics -- are urging teachers more specifically to observe the child's errors in the performance of a task. His errors are a demonstration by the child of his process of hypothesis testing, as he develops a plan for mastering the task. The teacher can learn a great deal about a child from the errors he makes in working at any task. Errors should not be viewed, therefore, as dismal failure, but as a positive attempt on the part of the child to relate to the elements of the task set before him. Thus, we view the CREED 5 Curriculum as both instructional and diagnostic; task mastery will aid the child in the process of perceptual-cognitive development. In addition, as he moves to mastery, his errors will help the teacher to refine her knowledge of his needs. When the teacher assigns tasks to the group or to the child, he must observe the individual as he engages in the process of learning and the solution of the problems set before him. If he does not take the opportunity to observe the child as an individual, then he will have very little basis for the diagnosis of the child's abilities and disabilities.

In our reports on the CREED projects (Project CREED 3, 1969), we have often criticized the use of one hour testing sessions by a psychologist as a basis for the diagnosis and remediation of problems of the deaf child with special learning disabilities. We would be less than candid if we did not criticize equally and strongly the diagnosis and remediation of the problems of the child with special learning disabilities by teachers who have seen him perform as an individual on only a few limited occasions, and on only a few tasks, all similar in range and nature.

The child should also be observed as an individual as he performs in a group. The differences found in his cognitive, affective and social behavior in group situations, as compared with one-to-one situations, should be carefully studied. From such observations, it should be possible to develop a description of the child's unique range of behavior.

(c) Observation by teachers, teacher-aides and supervisors should provide a firm basis for a generation of hypotheses about the child's abilities and disabilities. These hypotheses must be generated, however, by informed personnel; those responsible for the education of children must be as assiduous about increasing their professional knowledge and skills as are other professionals.

There is much that would be of great value to education in the new and exciting research in educational psychology, developmental psychology, perceptual psychology, physiology and medicine. Unfortunately, these results take years to reach educators. School personnel must find some means of keeping themselves informed; there must be channels of communication with other disciplines. Current dissemination facilities of the Department of Health, Education and Welfare, such as ERIC and the Clearing House for Research in Child Life, should help educators capitalize on research in allied fields. In addition, proceedings of the conferences of professional organizations are an invaluable source of important information. Provided with these materials, the educator of the deaf may select from them that which he believes will benefit his children.

The most valuable descriptions of the child's abilities and disabilities, then, will be those arrived at through meetings of a team of teachers, teacher-aides and supervisors who have kept themselves well-informed by taking advantage of the sources of information made available to them. At such meetings the group should not only describe the child's abilities and disabilities at different points in time, but should also develop instructional techniques for improving his progress.

(d) It is at the point at which the team designs experiences to meet an individual child's needs that the way in which the CREED 5 Curriculum is used becomes of critical importance. The team must consider carefully the level of functioning of the child in the Curriculum areas covered, and "match" him with appropriate levels of curriculum objectives. Such "matching" must be effected through a careful selection of appropriate objectives from within and among the five curriculum areas. No child should be subjected to a lockstep presentation of the objectives in this Curriculum, nor should the objectives and activities be presented in a "testing" atmosphere where total success is expected on first trial.

In some cases, it may be a goal of the team to aid the child in the eventual mastery of a curriculum objective through many exposures to variations of a task. The teacher, then, would not expect complete mastery; instead she would help the child to gain more and more from each exposure, laying a foundation for the time when he will be ready for complete mastery.

Both cognitive and affective goals may be fulfilled through the use of the objectives and activities in the Curriculum. Many of the activities can be used with small groups as well as with individuals, so that the team may plan instruction for groups where it is appropriate to the social, affective and cognitive goals under consideration.

The team should also provide many opportunities, independent and directed, for the child to work at variations of tasks already mastered. They cannot be assured of the child's competence upon one demonstration of mastery. Again, if we believe, as we do, that the objectives are sequential, then the child must be truly competent at lower levels if we are to move to more difficult levels of experience. Piaget's students (Furth, Vogat, Wohlwill) urge broad experience with a great variety of tasks at one level of development and many opportunities to work at them. This provides a widening of cognitive development at one horizontal level as the child is becoming ready for movement to a higher vertical level.

We urge the educators who use the CREED 5 Curriculum to carefully select from among its areas and objectives a "match" for the well-defined needs of their children, and to implement the tasks fulfilling the objectives as experiences rather than tests.

D. Conclusion.

The CREED 5 Curriculum represents a collaboration of efforts of the CREED staff and personnel from schools for the deaf in New York State. We believe this collaboration to have been a highly successful one; indeed, it is the strong belief of the CREED 5 staff that this curriculum could well prove of equal value to groups of children other than young deaf children with special learning disabilities. It should be remembered that ideas, goals and techniques from special education have often been the basis for the refinement of instruction in general education.

In conclusion, from the position of both educational psychologist and principal investigator of the CREED project, it has been exceedingly rewarding to see the goals one defined with some temerity in the original proposal executed so extraordinarily well through the efforts of a conscientious and expert staff and dedicated school personnel.

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CREED 5 CURRICULUM

Objectives and Activities

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Structure

The CREED 5 Curriculum is divided into six parts -- an initial section covering General Assumptions and a separate section for each of five instructional areas -- Gross-Motor Coordination, Sensory-Motor Integration, Visual Analysis, Attention and Memory, and Conceptualization. The format for the Initial Section is designed to present assumptions and objectives in terms of expectations for teacher behavior. The format for the five instructional areas consists of a sequence of broad instructional objectives, with subordinate specific objectives, all in terms of the child's behavior. Activities and materials for helping the child to master these objectives are included under each subordinate specific objective. There is a comprehensive introduction to each of the five areas that provides the user with important basic information about the foundations for the objectives and activities and with recommendations for implementation.

Because of the basic philosophy of the principal investigator, the objectives and activities for the instructional area of Attention and Memory are included within the other four instructional areas. Further explication of this specific change in format will be found in the introduction to that section.

As we have presumed a hierarchy of objectives within each area we have presumed a hierarchy among the five areas. While the relationship of Attention and Memory to the other areas is a unique one, yet there are inter-relationships among all. We believe that the earliest levels of Gross-Motor Coordination must be mastered before the finer skills of Sensory-Motor Integration can be performed with any level of success. Higher levels of Visual Analysis will be dependent upon the earlier development of Gross-Motor Coordination and Sensory-Motor Integration. And higher levels of performance on all areas must precede the mastery of many Conceptualization skills.

The curriculum designer responsible for the construction of each area will provide in the Introduction to that area further clues to the expectations for the fulfillment of the performance objectives.

It is doubtless very apparent to the reader that these areas are by no means discrete; for purposes of convenience for the user we have separated into 5 areas what are essentially overlapping and interdependent behaviors. We have chosen to isolate them only so that the teacher may become very familiar with the most critical behaviors in each area.

The Appendices provide the teachers and schools with information about the sources of materials and activities appropriate to the fulfillment of the objectives in the five instructional areas.

In addition, the Appendices include an extensive bibliography of titles considered by the CREED 5 staff to be important to the optimal functioning of a teacher working with young children.

The CREED 5 staff consider all sections of this curriculum to be critical elements in an integrated whole; we do not believe that it can be implemented "piecemeal." It is the hope of those of us who have worked very diligently in its construction that those who implement the CREED 5 Curriculum will consider it in the same way.

GENERAL ASSUMPTIONS AND OBJECTIVES

Lillian C. R. Restaino, Ph.D., Director

GENERAL ASSUMPTIONS AND OBJECTIVES

Lillian C. R. Restaino, Ph.D.

Introduction

The CREED curriculum was designed to provide the teacher of the young deaf child with special learning disabilities with a description of developmental objectives, and methods for fulfilling these objectives, in the areas of Gross Motor Development, Sensory-Motor Integration, Visual Analysis, Attention and Memory, and Conceptualization. These objectives and procedures were based upon several very important assumptions about the children for whom they were developed. These assumptions are the product of the interaction of the CREED staff with classroom teachers and supervisors, as well as consideration of current research and thought in psychology and education.

In proposing the assumptions we recognize that the teacher must be provided with special resources to help the special deaf child's performance on motor, perceptual and conceptual tasks. Of equal importance to us, however, is providing the teacher with special resources to help the child's affective development.

The level of success that the child reaches in the five motor-perceptual-conceptual areas is inextricably related to the level of motivation, ego-strength and positive expectation he brings to these tasks. We believe that it is essential that these factors be considered by each school and each teacher in implementing the objectives and procedures of the CREED 5 Curriculum.

The CREED staff designed the Objectives and Activities with the expectation that the teacher will view these components as SPECIFIC CONTENT which may be fit into varied instructional modes. In other words, the Objectives and Activities are designed for use in many educational structures; they are not an educational structure in and of themselves.

General Assumptions

The General Assumptions below are those that we strongly believe each school and each classroom teacher must consider in the development of all instructional activities that involve the deaf child with special learning disabilities, including the CREED 5 Curriculum.

Assumption 1

The deaf child with special learning disabilities moves through the stages of development in the same sequence as other children. As in all children, the many skills he needs to function in school may develop at different rates. The CREED 3 Project indicated that the performance of most special deaf children does not reflect bizarre behavior patterns; rather they may be at very early developmental levels in one skill area and at higher levels in others. They should, however, move through these developmental stages as any other child and must be provided with the opportunities to do so.

Assumption 2

The deaf child with special learning disabilities is seriously hindered in meeting the demands of classroom learning without previous training in skills prerequisite to subject area mastery. The demands of classroom learning in subject areas are such that subordinate skills must be mastered before we can expect any child to succeed in them. Many children acquire these subordinate skills without the direct aid of the teacher. The teacher of the special deaf child, however, must give careful consideration to the structure of these skills and to the environment in which they are to be mastered. The subordinate skills must be analyzed and specifically described, and the environment must be carefully prepared for him if he is to progress through them toward readiness for instruction in subject areas.

Assumption 3

Because the child's limited experiences with elements in his environment leads to greater rigidity of behavior than found in other children, the structuring of his environment by the teacher to insure progress in motor, perceptual and conceptual skills may further encourage such rigidity. As stated in Assumption 2, we must structure the environment for the child when introducing new learning and helping him to mastery of it, but we must also recognize that such deliberate structuring may provide little opportunity for him to adapt to even small changes confronting him.

It is essential that we systematically provide for the development within the child of the ability to react without confusion when presented with several alternative choices, and to make decisions based upon such alternatives. Because our goal is to lead him to the highest level of functioning of which he is capable within his environment, then we must systematically provide opportunities for him to develop strategies to meet changes in this environment.

Because the special deaf child depends on adults to make his decisions for him to a greater extent than most children, we must also systematically train him to assume an increasing responsibility for, and a larger role in, aspects of his own development.

Such training, in the case of independent behavior and problem-solving strategies, can be provided using elements of the CREED 5 Curriculum after careful consideration of each child's cognitive and affective level of development.

Assumption 4

The classroom experiences of the special deaf child constitute a greater proportion of his opportunities for learning than for other children; therefore, the interaction between the special deaf child and his teacher is more critical to his education than it may be for other children. Other children are better able to select from and integrate the varied unstructured sources of experience outside the classroom; the special deaf child is far more dependent upon the classroom structuring of experience for building his structure of knowledge. Thus, the teacher's role in his development becomes far more critical than for other children. Because she is so important to his progress as a thinking and feeling human being, the nature of interaction she has with him becomes as important as the content of her instruction.

Assumption 5

The deaf child with special learning disabilities has experienced failure to a greater degree than other children. Therefore, our attention must be directed not only to his progress in motor, perceptual and conceptual skills, but also to the enhancement of his ego-strength, his expectation for success, and his pleasure in trying. We must analyze skills to their fundamental levels and develop activities with small levels of increasing difficulty not only to provide him with the opportunity to eventually master skills at their highest levels, but also to provide him with the opportunity to succeed at some level. The teacher must provide continuous opportunities for successful performance in order to help develop a positive feeling in the child about his ability to do something well. Such positive feeling is an important source of motivation, and is absolutely essential if the teacher expects him to persist at tasks the child finds more difficult.

Assumption 6

There is, within the group of deaf children with special learning disabilities, as wide a range of individual differences as in the group of typically deaf children. These differences are found in their affective behavior as well as in their cognitive behavior. We have urged that teachers and supervisors observe the individual child intensively in order to diagnose his abilities and disabilities in perceptual-motor-cognitive areas; it is also essential that they study the child's behavior for cues to the kinds of communication and interaction patterns that seem to be productive or obstructive to his learning.

General Objectives

Each of the General Assumptions above implies a number of Objectives specific to the implementation of the CREED 5 Curriculum. We believe that it is essential for the school and the teacher to consider these objectives if the components of the CREED 5 Curriculum are to be optimally effective.

From Assumptions 1 and 2

Objective 1

The child is expected to perform sequences of tasks that are designed to help him develop motor, perceptual and conceptual skills in stages defined by specialists in child development.

a. The design of the tasks reflects patterns of the child's development and growth. It is expected that the teacher will present tasks at levels appropriate to her observations of the child's developmental stage of growth.

b. The tasks have been ordered in increasing levels of difficulty, based upon assumptions from developmental theory. Thus, it is assumed that the child will master the tasks at a lower level of difficulty before mastering a task at a higher level. Because of the difficulty in devising a valid hierarchy of skills, as well as the wide variation in children's experiences and the structure of their knowledge, it is entirely possible that a child may perform a higher-level task before completely mastering a lower-level task. In addition, it is to be expected that the child may accomplish a high-level task in one set of activities and a low-level on another set. Such variation may be the result of normal developmental processes _or_ problems unique to the child. Because of such variation, it becomes absolutely essential for the teacher to observe the child's performance, and to study the introductory sections to each of the five curriculum areas in order to obtain information to help her make a decision about the nature of the child's performance.

c. It is assumed that the child will demonstrate mastery of lower level skills before he is exposed to higher level tasks that have been specifically designed as an introduction into academic subject areas.

From Assumption 3

Objective 2

After he has demonstrated complete mastery of a task, it is expected that the teacher will provide the child with the opportunity to perform on further samples of the same task without teacher intervention or direction.

a. The teacher should provide the child with several examples at the same level of complexity, so that the child, having mastered one set of tasks, has the opportunity to continue to work independently of the teacher.

b. The teacher is expected to make available the materials for use at free time so the child has the opportunity to select from the varied tasks the one with which he wishes to work.

c. In order to provide the child with the opportunity to exercise decision-making and problem-solving strategies appropriate to his abilities, the teacher may modify the presentation of tasks. Examples of such use are:

- -- leaving out steps or items of previously mastered tasks
- -- combining steps or items of previously mastered tasks
- -- setting "obstacles" to completion of tasks previously mastered (obstacles ranging from obstructive physical objects to incorrect or incongruent items, etc.)
- -- encouraging the child to find new ways to use the curriculum materials and other classroom materials

From Assumption 3 (cont'd.)

d. It is expected that the teacher will exploit the desires of children to work with each other, independently of teacher intervention. Where children have mastered a task they should be encouraged to work together at other samples of the task.

e. It must be expected that different children will be able to function independently at different levels of complexity, for different lengths of time and at different physical and emotional distances from the teacher. It is essential, therefore, that the teacher make provisions for independence in view of her observations of each child. Some children may be permitted a great amount of independence, while for others only the simplest of activities may be performed independently. Every child, however, must be helped to some level of independence apart from direct teacher intervention, in regular classroom activities as well as with the CREED 5 materials.

From Assumptions 4 and 6

Objective 3

Each child is expected to perform the task sequence at levels appropriate to his motor, perceptual and cognitive deficits and to his rate of learning. Each child is expected to perform these skills in an instructional process that recognizes his unique affective needs.

a. It is expected that the teacher will use the tasks as diagnostic and instructional tools. While many of the tasks can be used with groups, it is strongly urged that, whenever possible, the teacher work with a child on a one-to-one basis. With all children, but most especially with special deaf children, it is essential that the teacher observe intensively the child's reactions and responses at each stage of a task. Much information of great significance is lost to the teacher if she does not engage at some time in working on a one-to-one basis with her children.

b. It is expected that the teacher will require the child to perform only those tasks he needs and may permit him to omit specific tasks at lower levels of a series, if he demonstrates mastery of related tasks at higher levels on several occasions.

c. It is expected that the teacher will select different combinations of task sequences and discrete tasks to meet the unique requirements of each child.

From Assumptions 4 and 6 (cont'd.)

d. The teacher must observe the child in order to determine the measure of physical distance, physical contact, encouragement, emotional support, praise, restriction and other aspects of affective interaction that he requires to function at a level optimal for him.

From Assumption 5

Objective 4

The child is expected to gain in positive feelings about himself, his teacher and his school as a consequence of his performance on the sequence of tasks.

a. The sequences of skills are designed so that the child can successfully master tasks at some level of all skills.

b. The elements of the curriculum are designed so that they may be implemented in any classroom structure with any teaching style. It is expected that the teacher will use the tasks with individual children in the kind of interaction pattern that she has found produces positive feelings in them.

c. It is expected, even after the teacher determines that the task is at the appropriate developmental level for the child and appropriate to his individual level of ability, that the child will demonstrate difficulty in mastering it. It is essential, therefore, that the teacher provide the child with the opportunity to select from and work at a variation of tasks, including those below his developmental level, in order to encourage the child's persistence in the more difficult ones.

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ATTENTION AND MEMORY

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ATTENTION AND MEMORY

Lillian C. R. Restaino, Ph.D. and Susan Rubenstein, M.S.

A. Introduction to Attention and Memory

Memory is one of the most complex processes of human functioning. In order to describe what it is all about we can organize it into an ATTENTION PHASE, a SHORT-TERM MEMORY PHASE and a LONG-TERM MEMORY PHASE.

1. Attention

By the ATTENTION PHASE, we mean the process we all go through of concentrating on only some of the things in our environment, while shutting out others. Thus, while many sounds and visual images are always present, we carefully select only a few to pay attention to. We all have had the experience of suddenly becoming aware of sounds or images that have been in our immediate environment all along. We had not been concentrating on them, however, so we only become aware of their existence as we deliberately directed our attention to them. This ability to "shut off" parts of our environment until we direct our attention to them is important to our survival; our lives would be impossible if we concentrated on everything. The ability to deliberately select certain parts of our environment to attend to and concentrate on helps us considerably in dealing with the thousands of objects and events confronting us. We are able to concentrate on the parts we want to, and the parts upon which we concentrate are the ones we can begin to remember.

For the purposes of classroom learning, we can consider two functions of attention: focussing attention and scanning productively.

The child must master the skill of suppressing elements surrounding the objects or events he is being required to consider. He must be helped to focus attention on elements for a long enough time to permit information to be processed in his memory system. It is quite difficult for many children to develop the ability to sustain this focussing of attention; however, it is even more difficult for them to develop the skills needed for the productive scanning of objects and events. Skilled productive scanning requires that the child systematically focus his attention for a sufficient period of time on all parts of an object, in order to obtain enough sensory information to get an image. Thus, if a child scans an object too quickly or incompletely he will not obtain an accurate image of the element being perceived.

There seems to be some kind of a physiological change between the ages of 5 and 7 years in the ease with which a child can direct attention for a long period of time. Even two-year olds, however, will sustain attention for long periods of time when curiosity, novelty and personal accomplishment are involved in the activity. In other words, motivation can be a very important factor in the child's sustaining of focussing or productive scanning. Motivation in this case includes the "novelty" of the materials used, the consistent change in aspects of their appearance, as well as the successful accomplishment of tasks. These are all "pay-offs" that help the child to inhibit behavior that would interfere with attention to the task at hand. With children who have very great difficulty in attending, more tangible "pay-off" must be used, as in the immediate reinforcement of behavior modification.

2. Short-Term and Long-Term Memory

The other two phases of memory are more difficult to describe. Since our interest is in aiding the child's ability to remember over long periods so that he can profit from what it is we wish to teach him, this area of the curriculum will be concerned with objectives that will aid his long-term memory.

The child must first hold information in his short-term memory, however, before he can store it in his long-term memory. We must become familiar with both phases, therefore, if we are to help him remember what he learns.

SHORT-TERM MEMORY is the process whereby the child "holds" images of the objects and events for a few seconds of time.

LONG-TERM MEMORY is the more complex process whereby the child selects from the images in his short-term memory and places these selections in the structures he has built from past images, i.e., structures built from his past experiences.

Our first task, then, is to help the child to develop methods for organizing information in his short-term memory so that he can hold it long enough for it to be selected and stored in his long-term memory. We know that there are severe limitations on the number of things we can enter into our short-term memory--about 5 units at any one time for adults and about 2 units for pre-school children. Thus, we can hold a telephone number (10 units) in our short-term memory only if we reorganize the numbers into smaller units. Instead of thinking of each number separately -- 2-1-2-7-8-9-1-2-2-3 (10 units) -- we regroup them into 4 units, 212-789-12-23 (4 units).

When the child must remember more than 5 units, it is up to the teacher to structure, organize and classify items so that she will not require him to remember more units than he is capable of. We must carefully group things if they are to be stored in the child's short-term memory.

Our second and more complex task is to help the child store information in his long-term memory. This task requires that we help him build systematic structures (such as associations or categories) to fit all the things we teach him. In other words, the efficiency with which the child remembers things for long periods of time and can get at them when the teacher asks him to, is a direct result of the way in which they were presented to him in the first place. The child will remember things better if he has certain strings of associations or classifications already developed to link them to -- which is another way of saying from the "known to the unknown."

Thus, in order to insure that the child will remember later what we teach him now, we must provide him with methods to organize the information we give him.

What we are saying here is that if we expect a child to remember things, then we must help him to master those things on three levels: he must be able to ATTEND to them out of all the other things in his environment; he must be able to GROUP large numbers of things together because of the limitations of his short-term memory; and he must fit these groupings into a TOTAL SYSTEM because it will increase the chances that they will be remembered out of his long-term memory storage in the future.

B. Arranging the Learning Situation: General Objectives for Teacher Performance

From the above discussion, it is apparent that setting up the situation is as important an element in the child's learning as the task content. Because Attention and Memory are involved in all the learning experiences of the child, we believe that it is important to describe for the teacher selected objectives for setting up optimal conditions to aid the child in attending and remembering the content of her instruction.

Thus, the first set of objectives do not describe the expectations for performance by the child; they describe expectations for performance by the teacher in arranging the conditions of the learning situation. No special activities are designed to accompany these teacher objectives, because it is expected that they will be utilized in arranging the learning situation for all tasks presented to the child.

General Objective I:
The teacher must provide a learning situation in which the materials or events that the child will be expected to remember stand *clearly apart* from other materials and events. The specific materials and/or events that the teacher wants the child to consider must be made clear through such devices as physically *grouping* them apart from other materials or events in the classroom, the use of *attractive* and *novel format*, and her *direct* instruction of the child to look at, listen to, or touch, specific items or parts of items.

General Objective I: *To present materials or events that the child is expected to remember clearly apart from other materials and events*.

Specific Objective 1: To isolate specific materials and events by physically grouping them apart from other materials and events.

Specific Objective 2: To isolate specific materials and events through the use of attractive and novel formats.

Specific Objective 3: To direct the child's attention through direct instruction for him to look at, listen to, or touch specific items or parts of items.

General Objective II:
The teacher must help the child develop approaches for grouping large sets of information into units that he can remember. Since he can reasonably be expected to process no more than 5 units in a period of 15-20 seconds, then she can increase the number of units by increasing what he puts into each *unit*. Thus, even a skilled reader can't be expected to process the 11 separate letters -- S-H-E-W-E-N-T-H-O-M-E -- in 15 seconds, but he can process 3 units "SHE WENT HOME" made up of larger groupings. She must devise similar "groupings" of objects, events, etc.

The teacher must study beforehand the materials and events that she expects her child to remember, to find groupings of specific attributes or parts that will help him encode these materials and events. The teacher expects the child to remember many ideas,statements and images that are presented fleetingly. Thus, she must help him to develop his own way of grouping. As she helps the child develop such approaches,she provides the opportunity for him to exercise flexibility in the selection of alternative ways in which to group. If she presents 8 units of information -- be they objects or words, presented visually or orally -- and she expects him to remember them, then she must help him to learn ways of regrouping. The child must be aided in an activity where he has previously been left to his own devices. In other words, if we don't actively help him to develop successful approaches, he may develop incorrect ones on his own, or will fail to develop any at all. If the teacher wants the child to process a triangle, then she can help him to develop a strategy for entering this form in his short-term memory. For example: she might direct his attention to the 3 points. Encouraging him to use labels when he has them and letting him repeat these labels will increase the chances that he can keep them in his elusive short-term memory. If we think about how many things we as teachers present to our children in rapid-fire succession and yet expect them to remember, then we can see the importance for helping him to develop some way of confronting all the information with which we inundate him.

General Objective II: To provide the child with experience in the grouping of events and materials to increase his success in remembering them.

Specific Objective 1: To organize and group materials and events to be remembered into smaller units.

Specific Objective 2: To direct attention to the significant parts of the materials and events to be remembered.

Specific Objective 3: To label parts of units for the child; to label groupings of units for the child.

Specific Objective 4: To encourage the child to repeat the labels while attending to the materials and events.

Specific Objective 5: To provide the opportunity for the child to perform Specific Objectives 1-4 without direct teacher intervention.

General Objective III:
The teacher must place all new information in a carefully developed structure, so that the child is provided with a set of relationships into which he can put the new learning at the time it is presented and from which he can retrieve it later. In other words, the child will be successful in storing information in his long-term memory only if he can fit it into a meaningful structure; if the teacher expects him to remember materials and events for future use, she must either relate it to information she believes the child to have already, or she must present information in a way that helps him build a context, e.g., animals, into which to fit appropriate parts, e.g., cats, dogs. An example of such an inclusive system

is the classification system -- clothing (shoes, hats); animals (monkeys, lions).

General Objective III: To provide a carefully developed structure for all materials and events the child is to remember.

Specific Objective 1: To relate materials and events to those materials and events considered in the past, on the basis of:

--similarities and differences
--common categories (animals, furniture,etc.)
--common characteristics (size, shape, color, etc.).

General Objective IV:
When a child is expected to perform a task, whether it be classifying objects, discriminating shapes, spelling words, or adding two numbers, the teacher should provide him with a model of the correct response with which to compare his own response. If he responds incorrectly, and has no opportunity to see what it is that he has done incorrectly, we increase the chances that he will remember and learn the incorrect response. When he has a correct model immediately available with which to compare his response, then we are helping him in the correct processing of information into the "attention and memory" systems.

In addition to the correct "feedback" that models give the child to help him correct his response on further repetition of the task, when his response and the model are the same, it can become a source of positive motivation!

General Objective IV: To provide a model for the child with which to compare his completed task:

Specific Objective 1: To demonstrate the task for the child, placing your demonstration model of the completed task before him.

Specific Objective 2: To cover the completed task elements while the child performs the task.

Specific Objective 3: To provide the child with the immediate opportunity to compare the teacher's model of the completed task elements when he completes the task.

Specific Objective 4: To provide the child with the opportunity to see completed task elements while responding -- if he expresses such need.

C. Objectives and Activities for Attention and Memory: Objectives

The second set of objectives are presented in terms of the child's behavior. We have attempted here to analyze the different factors that are involved in the presentation of information to the child.

Since these factors are characteristic of school learning in general, we believe that we must provide deliberate and systematic help for the child so that he will develop strategies for school learning.

Attention

These General Objectives describe strategies that a child must master in order to begin to encode information.

General Objective I: To focus on one distinct feature of one object.

General Objective II: To scan by systematically focussing on more than one distinct feature:

Specific Objective 1: To scan by systematically focussing on more than one distinct feature of one object.

Specific Objective 2: To scan by systematically focussing on one or more distinct features of several objects, one at a time.

General Objective III: To sustain attention for increasing periods of time.

Memory

The General Objectives in this section define aspects of school learning tasks that are presented to children. The Specific Objectives describe specific skills that are demanded by the task factors.

General Objective I: Length of Presentation of Materials or Events. The amount of time that a child has to inspect, study and process materials and events is an important determiner of successful memorization. If we are to provide the child with the opportunity to develop skill in memorizing materials and events presented for short periods of time, then we must consider memorization on the basis of time of presentation as one objective.

Specific Objective 1: Long Period -- to develop the ability to remember material and events after a long exposure (for more than 5 seconds).

Specific Objective 2: Short Period -- to develop the ability to remember material and events after a short exposure (for less than 5 seconds).

General Objective II: Sensory Systems Employed. Difficulty in Memory processing varies across different sense modalities. Training in Visual Memory, for example, need not transfer to skill in Auditory Memory. In order to provide the opportunity for the child to develop skills in memorizing materials and events presented through different senses, we must consider the variation of sense modalities in our objectives. In addition the child is required to process materials and events across sense modalities, e.g., tactile to visual. Therefore, our objectives will include the development of this skill.

Specific Objective 1: Visual -- to develop the ability to remember materials and events that are presented visually.

Specific Objective 2: Tactile-Kinesthetic -- to develop the ability to remember a tactile-kinesthetic stimulus.

Specific Objective 3: Auditory -- to develop the ability to remember an auditory stimulus.

Specific Objective 4: Cross-Modalities -- to develop the ability to remember a stimulus through a sense modality other than that through which it was presented.

General Objective III: Number of Units Employed. The number of units that a child is required to remember is another determiner of his success in this skill. Research indicates that short-term memory permits processing of only a few units at a time. In addition, it has been shown that older children and adults can process more units in the same amount of time than can younger children.

When a child is required to consider a large number of items, he must group these items into smaller units if he is to remember them. If we are to provide the child with the opportunity to gain skill in restructuring units, then we must carefully control the increase in the number of units required. We must consider the number of units as another objective in the development of short-term memory.

Specific Objective 1: Few Units -- to develop the ability to remember 2 or 3 objects or events.

Specific Objective 2: Many Units -- to develop the ability to remember 4, 5, 6, or 7 objects or events.

General Objective IV: Level of Representation. The level at which materials and events are represented is another determiner of differences in memorization. We are assuming that the young child will have less difficulty in remembering concrete objects and events than representations (pictures, drawings) of these objects and events. We must therefore recognize that different levels of representation will make different demands upon short-term memory. Our objectives must include the requirement to develop skills across all levels of representation. In addition, the child is required to process materials and events across levels of representation. Our objectives must include development of this skill.

Specific Objective 1: Concrete -- to develop the ability to remember objects and events in his environment.

Specific Objective 2: Representational -- to develop the ability to remember pictures of materials, events, geometric shapes or colors.

Specific Objective 3: Abstract -- to develop the ability to remember abstract symbols (letters, digits, mathematical notations or nonsense forms).

Specific Objective 4: Across Levels of Representation -- to develop the ability to remember materials or events at a level of representation other than the one in which it was presented.

General Objective V: Ordering of Recall. Under Conceptualization we recognize that the child must be provided with opportunities to develop the ability to order materials and events. Memory for sequencing of materials and events is a far more difficult skill than memory for random order. Since the child is expected to master both skills for school learning, we must design tasks to develop both.

Specific Objective 1: Unordered -- to develop the ability to remember a collection of materials or events in any order.

Specific Objective 2: Specific Order (Sequential) -- to develop the ability to remember a collection of materials or events in a sequence.

General Objective VI: Methods of Recall. The child is required to demonstrate memorization in several ways by indicating recognition of the materials and events and/or by reproducing them. Reproduction and recognition are dependent upon very different processes. It is essential, therefore, that we consider each separately in our attempts to develop short-term memory ability.

Specific Objective 1: Recognition -- to develop the ability to remember by recognition.

Specific Objective 2: Reproduction -- to develop the ability to remember through reproduction.

General Objective VII: Level of Activity. The active involvement of the child in the manipulation of objects and/or events that he is required to memorize most probably contributes to the efficiency with which he remembers them. We must include in our objectives for the development of short-term memory the level of the child's involvement.

Specific Objective 1: Gross Motor -- to develop the ability to remember events through gross-motor involvement; e.g., to reproduce a series of actions performed.

Specific Objective 2: Sensory-Motor -- to develop the ability to remember objects or events through perceptual motor involvement; e.g., to remember a group of objects through manipulation of these objects.

Now that we have isolated the factors important to memorization of school learning, we must, in order to develop the child's memory skills, put these components back together again.

We must repeat that the factors were considered separately only to provide an awareness of the task demands that we are placing upon the child. Each activity is, however, comprised of some level of each of the task factors.

To provide a source of easy reference to the factors, a table is presented on the next page.

It is difficult to determine the level of difficulty within each category because each child will find success with a different combination.

Seven Objectives Involved in the Development of Short-Term Memory Skills

Length of Pres.	Sensory Modality	Number of Units	Level of Representation	Random or Sequenced	Reproduction or Recognition	Level of Activity
Long	Visual	2	Concrete	Random order	Recognition	Gross Motor
Short	Kinesthetic	2 - 4	Representative Materials	Specific Order	Reproduction	Sensory-Motor
	Auditory	5	Abstract			
	Cross-Modalities	6+	Across Levels of Representation			

In presenting both Task Objectives and Teacher Objectives, we are providing the teacher with the opportunity to observe her child, formulate hypotheses about his abilities and disabilities based upon tests and her experiences with him, and then to select activities based upon a combination of objectives that she believes are appropriate to his needs.

The following section presents a detailed description of a method through which the teacher implements the objectives.

Sample: Implementation of Teacher and Task Objectives.

1. The teacher should approach the memory tasks by first determining the level at which the child is functioning and then select the appropriate combination to meet the youngster's needs.
2. Once the appropriate combination is selected, the teacher must decide what materials she would like to use so that she can work within the combination she has selected.
3. The teacher should then attempt to structure her presentation, taking into consideration General Objectives for Arranging The Learning Situation, pp. 3-6.
4. The last step is for the teacher to actually present the memory task to the youngster.

If the teacher has decided that she should begin a child at the introductory level, she might be presenting a task according to the following combination:

1. Long Presentation
2. Visual Sense
3. Two Units
4. Concrete
5. Random Recall
6. Recognition
7. Gross Motor.

The teacher should then decide which two concrete units she will be selecting for inclusion in this particular task. She might decide to use a fire engine and a doll. The teacher might select these two items because:

1. the child has often played with these toys, has had success with them, and seemed to like them;
2. they might be new and therefore of interest to the youngster. If the teacher provides a learning situation whereby the material is attractive to the youngster she has met her first objective. Then she can proceed to shift her focus to developing strategies for remembering.

She could meet General Objectives II and III for Structuring the Learning Situation by:

1. talking about the fire engine with the youngster;
2. discussing its uses, its color, and labeling it so that the child can begin to associate what he is seeing with its name·
3. having the child touch and explore the different materials that are used in its construction.

By doing the above, the teacher will have succeeded in meeting her second objective.

The teacher will begin to build a context for the child if she points out that the fire engine has four wheels and then cites other objects that also have four wheels. Here she has begun to meet General Objective III.

The teacher might go through a similar procedure with the doll.

After the teacher has attempted to deal with her objectives, then the task actually begins. She is using the fire engine and the doll. (There are only 2 units, and they are concrete.) She says, "Look at the fire engine and the doll" (Visual Sense). She allows the child to look at these objects for more than 5 seconds (Long Presentation). "Run and get them" (Gross Motor and Recognition). It does not matter which one the child retrieves first (Random Recall).

D. Objectives and Activities for Attention and Memory: Activities

Attention and Memory involve all areas of this curriculum whether it be Gross Motor Skills, Sensory-Motor Integration, Visual Analysis or Conceptualization. Tasks can be created using any combination and any material available. In order to illustrate this point more clearly, the sampling of activities for Attention and Memory will not follow this introduction, as in the case of the other areas, but will be interspersed throughout the curriculum. The tasks were constructed in such a way as to give many different illustrations of the types of combinations possible. Because the particular combination selected may not suit your individual child's needs, some suggestions are made to change the combination to either make the task easier or more difficult.

It should be emphasized that these tasks are merely a sampling of all the possible tasks you can construct and the suggestions offered do not represent all the possible changes that can be made. In order to adequately help your child develop in this area, we encourage you to make tasks and combinations using all the materials that are available to you.

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VISUAL ANALYSIS

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Introduction

The infant's visual system is actively involved in analysis of his environment; the objects and people in it. Through the association of a perceptual discrimination with an event, e.g. the nipple of his bottle or his mother's face with a satisfied appetite, the child further defines the objects and persons in his environment.

Gradually, through many experiences and interactions with his environment the child builds up a large "vocabulary" of perceptual information. He comes to school at the age of 3 or 4 knowing that certain objects in his environment, although seeming to vary, actually do not; his mother disappears only to return; a ball rolling closer and seeming to get larger is the same ball; his toy falls down, and seen from above, it is still the same toy. His visual analysis skills are quite sophisticated when it comes to visually matching objects in his environment, especially familiar objects.

By the age of 3, children should also be able to identify the photographs, outline drawings and silhouettes of familiar objects. He masters this skill, we believe, because the outlines of objects provide a great deal of information in visually discriminating the real objects.

The end goal for the classroom teacher in helping her children to develop skill in visual analysis is, of course, reading. Because most children of ages 5 or 6 do not scan printed material in a systematic manner, and do not stop and focus their vision on the most important features of what they are looking at, the teacher's first task must be to help the child develop and master these basic skills.

In order to develop skill in visual analysis, certain procedures must be followed if we are to expect minimal success. Among these is the gradual increase in the complexity of the figure to be discriminated. Thus, the tasks included in this section are ordered so that the child must first discriminate forms with few elements, progressing to the discrimination of complex forms with many elements. While most normal kindergarten age children should be able to match single letters, matching groups of 2 or 3 letters is still a difficult task. The first and last letters are more likely to be matched correctly than the middle letters.

Normal children of this age will also continue to make mistakes in matching letters that are mirror reversals of one another such as b and d, p and q, etc. This is understandable if a child brings to a letter discrimination task the concept of perceptual invariance -- viz., objects do not change when rotated or seen from another perspective. Thus, he believes that letters (b, p) changed in space are still the "same object."

Since the child is actually capable of seeing the differences he must be helped to attend to them. He must be taught that while he has to ignore these perceptual differences in objects in space they are meaningful in letter discrimination. He must learn that these symbols are unique. In addition, there should be a gradual increase in the distracting elements of the surroundings in which the discrimination must be made. We again present the tasks in sequential order to fulfill this requirement.

The most crucial element, and the one that must be present in all situations in which the child is expected to discriminate, we place squarely in the hands of the teacher: viz., the development in the child of a strategy for the progressive discrimination of features of objects and symbols. The teacher, in the course of his classroom instruction, must help the child develop skill in searching for distinctive features that will help in discriminating and matching objects and symbols.

Perceptual invariance is of equal importance here, too; while p and q differ

The teacher must also direct the child's attention to and help him identify perceptual invariants: those characteristics that remain unchanged despite changes resulting from the object's position or the angle from which the object is seen. Thus, the child must master a very fine skill -- he must see that the letter "a" is the same whether printed on the chalkboard and seen from a distance, or seen in a reading book held at an angle or printed on a worksheet placed flat on his desk. He must master this skill while he is mastering the fine skill of discriminating certain changes as important.

If the teacher does not help the child to develop these strategies by systematically directing his attention to both distinctive and invariant features in the task elements she presents as part of her classroom instruction, then, in essence, she is forcing the child to teach himself.

Many of the objectives and activities in the Visual Analysis section of the curriculum are similar to those in the Conceptualization section. Since the objectives require conceptual thinking and visual analysis they have been included in both sections in order to provide continuity of developmental sequence. Indeed, the discrimination of letters requires the attribute consideration important to concept building.

If a child is unable to master certain objectives, present him with easier tasks to make certain that he has the necessary prerequisite skills. If he has acquired those skills, present a variety of activities designed to achieve the same educational objective, each time taking care to direct the child's attention to the perceptual invariants and the distinctive features of the material you are asking him to discriminate.

Another possible cause for a child's failure to perform the visual analysis tasks that you have asked him to do may be an impaired visual mechanism. If you notice squinting, excessive blinking, tilting of the head for reading, encrustation around the eyes or any other suspicious eye behavior follow your school's procedures for referral to an eye care specialist.

While we have attempted to remind the teacher of her teaching responsibility in the tasks presented in this section, we believe that an approach of ongoing observation, diagnosis of learning strengths and weaknesses, and active involvement in the teaching-learning process should become an inherent part of her teaching style.

General Objective I: To develop the ability to match a single three-dimensional object with another three-dimensional object.

Specific Objective 1: To match three-dimensional objects--

a. toys;

b. geometrical models;

c. alphabet letters, numbers.

Materials

Any three-dimensional objects, such as toys, geometric models, blocks, alphabet or numeral blocks, etc. with duplicates of each.

Activities

1. (For S.O. 1a)
Place three toys in a row on a table in front of the child.
Place duplicates of the three toys on a table.
Demonstrate by placing the toys that are the same next to one another.
Have the child place the toys together that are the same.
If the child is unable to match like objects, direct his attention to specific parts of the objects and point out the fact that they look and are indeed identical.

2. (For S.O. 1a)
Using different objects, increase the number to 6. Have the child match those objects, following the procedure in Activity #1 above.
When the child is able to do this activity move to Activity #3 below, using more abstract forms.

3. (For S.O. 1b)
Follow the same procedure as Activity #1 above, this time using geometric models such as spheres, cubes, cones, etc.

4. (For S.O. 1c)
Follow the same procedure as in Activity #1 above, this time using three-dimensional symbols, such as alphabet or numeral blocks.

Attention

General Objective II: To scan by systematically focussing on more than one distinct feature.

It should become apparent that successful perceptual discrimination requires systematic scanning

In order to help the child master the discrimination and analysis of objects the teacher should:

1. Direct the child's attention to the attributes of a figure, e.g., a square. Indicate that the square has four corners while a circle has none.

2. Have the child trace the shapes so that he physically experiences the specific difference between drawing a corner (as in a square) and drawing an arc (as in a circle).

NOTE: This type of direction can be applied to each of the Specific Objectives under this General Objective.

To Make the Task Easier, change the combination in the following ways:

Sensory Modality. In order to help the child to build a structure of associations to the objects, have the child feel the objects, affording tactile stimulation. Label the objects, giving verbal associations.

Number of Units. Reduce the number of objects used to 2.

To Make the Task More Difficult, change the combination in the following ways:

Number of Units. Increase the number of objects used.

Level of Representation. Follow the same procedure using geometric blocks or letters.

Using the materials described in the Visual Analysis G.O.I, S.O.2, S.O. 3 and S.O. 4, and G.O.II, S.O.1, devise a memory task using a similar format as the one described above.

Memory Task

After the child has shown the ability to match 3-dimensional objects, repeat the task adding the memory factor.

Combination:

Long Presentation	Specific Order
Visual Modality	Reproduction
3 Units	Sensory Motor
Concrete	

Materials

Three-dimensional objects, geometric models, letters or numerals blocks, 2 of several objects found in the classroom, e.g., toys, books, pencils, erasers, milk cartons, etc.

Activity

Clear the area of distractible stimuli so that the child will be focussing on those objects that you place in front of him.
Place 3 objects in a row in front of the child.
Allow the child to look at the objects for a period longer than 5 seconds.
With a cloth or a paper, cover your row of objects so that the child can no longer see them.
Give the child a duplicate set of 3 objects.
Have the child place the objects in an order corresponding to your model.
Remove the cover, exposing the model row of objects.
Have the child compare his sequence to yours.

Visual Analysis
G.O.I S.O.1

*Sensory Motor Integration
G.O.IV S.O.2

Memory Task

Combination:

Long Presentation
Cross Modality
3 Units

Recognition
Random Order
Sensory-Motor

Materials

Any tool that must be squeezed or otherwise manipulated to pick up and release small objects.

Activity

Select a tool that can be used to pick up, place, and release objects.
Have the child close his eyes or, if he permits, blindfold him.
Place three objects on the table.
Guide the child's hands over each object so that he explores them thoroughly for a period longer than 5 seconds.
After the child is finished, place those 3 objects and any 2 others before him. Remove the blindfold.
Have him use the tool to select the objects he has just felt.

To Make This Task Easier, change the combination in the following ways:

Modality. Use only the visual modality. Let the child view objects and present him with 2 other objects. Have him select what he saw, picking up the objects with the tool.

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this S-M-I objective before he can be expected to attempt the Visual Analysis Objective.

Number of Units. Reduce the number of objects that you use:

a) let the child view or feel fewer objects;
b) reduce the number of objects from which the child has to make his selection.

To Make The Task More Difficult, change the combination in the following ways:

Length of Presentation. Allow the child to feel the items for a shorter period of time.

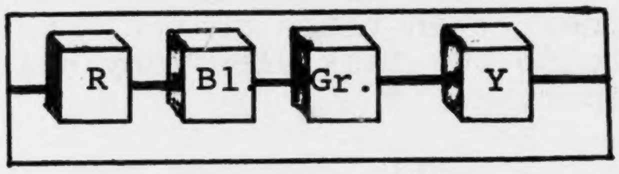
Number of Units. Increase the number of objects.

Level of Representation. Across level of representation have two-dimensional pictures of the objects you are selecting.
After the child has felt the items have him select those items he felt from a series of pictures.

Specific Objective 2: To match objects of the same size and shape, varying in color only.

Materials

A variety of objects which vary in color but are identical in all other respects. You might use 1" cubes, beads, etc. A compartmented container, such as a muffin tin or egg carton. An easy way to display beads is to string 7 of them on an elastic, tie the elastic and slip it over a piece of stiff cardboard. The elastic will allow you to display as many of the beads as you want while the remainder can be slipped to the back, out of sight. For this Specific Objective use beads that are all of the same shape but vary in color.

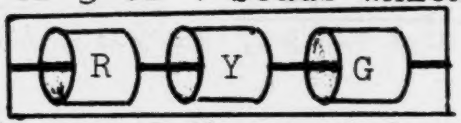


Make a Color Pattern Notebook from textured fabric samples that may vary in pattern but are of the same color.
Cut two of each sample; paste one on a piece of lightweight cardboard and slip the other into an envelope which has been pasted onto the back of that cardboard.
Put all the pages into a looseleaf notebook.
You can make the task easy by having only a few (3 to 4) samples that are very different in color on one page or make the task difficult by having many (8 to 12) samples that are quite similar in color on a page.

Activities

1. Place several objects of the same size and shape but of different colors in front of the child on a table.
   Give him the matching objects.
   Have him place the objects of the same color next to one another.

   For the child who has difficulty in motor control or shows impulsive behavior, place each object in a compartment. Use either a muffin tin, an egg carton or any compartmented container.

2. Display a pattern of 3 or 4 beads which differ in color.
You might display 

Give the child a lace and the container of beads. Have him string beads so that they are in the same color order and of the same shape as the pattern on the card.
Increase up to seven the number of beads to be matched.

If choosing the correct beads from the whole container of beads is too difficult because the child lacks motor control or is confused by the quantity, place all the beads of one shape in a separate shallow container.

As the distractible child is able to tolerate more stimuli put two shapes of the beads together in one container, then three shapes, and so on, until he is able to do the task with many different beads in the container.

3. Remove the fabric swatches from the envelope on the back of the page of the Color-Pattern Notebook.
Match the swatches to the samples on the page.
Have the child match the fabrics.
If the task is too difficult or distracting with several samples showing on the page, cover some of them and have the child match only those displayed samples.
Have the children search for samples and make their own pages.

Visual Analysis

G.O.I S.O.2

Attention Task

General Objective IIb: To scan by systematically focusing on one distinct feature of several objects one at a time.

Combination:

Short Presentation	Specific Order
Visual Modality	Reproduction
4 Units	Sensory-Motor
Abstract Material	

Materials

Construction paper and a flashlight.

Special Material Construction for this Activity

Select 8 pieces of construction paper so that you have 4 different colors, 2 papers for each color, e.g., 2 red, 2 blue, 2 yellow, 2 orange.
Take one of each color.
Hang the papers in varying locations around your classroom.
Using the other sheets, cut eight 2" squares so that you have two sets of 2" squares for each of the 4 colors.
One set of squares should be used for your model.
Arrange the squares in a specific order, e.g., yellow, orange, blue, red.
Do not let the child see this arrangement.
This is the model you will use to help the child check his responses.

Activity

Position the child so that he will be able to follow the flashlight's beam.
Focus the flashlight (in some order) on the pieces of construction paper mounted on the walls for a period shorter than 5 seconds.
The order in which you focus on the colors should correspond to the model that you have previously set up with the squares.
Give the child the second set of 2" squares.
Have him arrange the squares in the same order in which you illuminated them.
He can compare his arrangement to the model you had previously made.

To Make Task Easier, change the combination in the following ways:

Number of Units. Reduce the number of colors you use.

Length of Presentation. Keep the flash focused on the colors for a period longer than 5 seconds.

Random Order. Have the child select the colors in a random order.

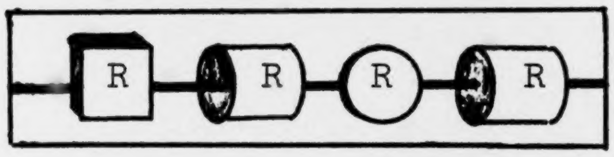
Recognition. Prepare 3 different sets of colors, e.g., set 1 of red, brown, green, blue; set two, of brown, blue. orange, red; set three of yellow, orange, blue, red-one of which will correspond to the order of your flashes.
After you have finished focusing the beam on the colors, present the child with the 3 sets.
Have him pick the set that corresponds to your flashes.

NOTE: You might repeat the task introducing M&M's as a motivational factor, e.g., instead of making a model out of 2" colored paper squares, use the M&M colors that correspond to the ones you have hung on the wall. Give the child a bunch of M&M's after you have flashed on the colored paper. Have him make an arrangement, using M&M's that correspond to the flashes he has just seen. Have him compare his arrangement to your model. If he is correct, the M&M's can serve as a reward.

Specific Objective 3: To match objects of the same size and color, varying in shape only.

Materials

A variety of objects that vary in shape but are identical in all other respects. You might use blocks, beads, etc. For instructions in making a display of beads see page VA-3. For this Specific Objective the beads would have to be of the same color but vary in shape; e.g.,

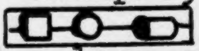


Activities

1. Place several objects that are the same size and color but of varying shapes in front of the child.
   Give him the matching objects.
   Have him place the objects that are the same next to one another.

   If the child is unable to do this activity, direct the child's attention to the similarities between the two like objects. Separate the objects spatially so that the child is not confused by the other shapes.

2. Display 3 or 4 beads which are the same color but vary in shape. For example, you might show the child:

   Give the child a lace and the container of beads. Have him string beads so that they are all of the same color and are in the same shape pattern as you have displayed.

   If the task is too difficult because of the child's poor motor coordination or because the child is distracted by the number of beads in the container, place all beads of one color in a container.

   Gradually, as the distractible child is able to tolerate more stimuli, put two colors of the beads together, then three colors together until he can do the task with many colored beads in one container.

Visual Analysis

G.O.I S.O.2 and 3

Memory Task

Combination:

Long Presentation	Specific Order
Visual Modality	Recognition
4 Units	Sensory Motor
Across Levels of Representation	

Materials

A variety of objects which vary in color, but are identical in all other respects, such as 1-inch cubes or beads. An easy way to display beads is to string 7 of them on an elastic, tie the elastic and slip it over a piece of stiff cardboard. The elastic will allow you to display as many of the beads as you want while the remainder can be slipped to the back, out of sight. Using paper and crayons make a 2-dimensional representation of your beads. Make 2 other bead sequences that vary from the original pattern.

Activity

Select a sequence of 4 beads from the bead card.
Let the child view the card for a period longer than 5 seconds.
Remove the card from view, placing 3 drawings of bead sequence pictures, including the picture that matches the sequence on the model bead cards, in front of the child.
(You will have to cover the beads on the drawing that you are not asking the child to remember).
Have him select the picture that matches the bead card.
Have him check his own response by comparing it to the bead pattern card.

To Make Task Easier, change the combination in the following ways:

Sensory Modality. Have the child feel the beads.

Number of Units. Decrease the number of beads.

Level of Representation. Provide the child with a 3-dimensional model and 3-dimensional choices, i.e., have a standard bead card pattern and 3 other bead card patterns, one of which matches the standard.

To Make Task More Difficult, change the combination in the following ways:

Length of Presentation. Decrease the amount of time the child views the material.

Number of Units. Increase number of units (beads). Increase the number of pictures from which the child has to recall the correct match.

Specific Objective 4: To match objects of the same color and shape, varying in size only.

Materials

Any three-dimensional objects which vary in size but are identical in all other respects.

Activities

1. Place several objects that are of the same color and same shape, but varying in size, in front of the child.
   You might begin with three red circular blocks, small, medium and large.
   Demonstrate the activity for the child by matching objects of the same size.
   Give the child the matching objects.
   Have him place like objects together.

   If the child is unable to do the activity direct his attention to the like sizes of the objects you are placing together.
   Dramatize and/or gesture large, medium and small, making spatially separated piles of large, medium and small objects.

General Objective II: To develop the ability to match colors.

Specific Objective 1: To match an array of different colors.

Materials

A variety of objects that are of different colors, such as 1" cubes, beads, blocks, spools of thread, toys, etc.

Activities

1. Place 5 to 7 objects (cubes, beads, etc.) of varying colors in front of the child.
   Give the child the color-matched objects.
   Have him place the objects of matching colors together.
   This task is easiest when the objects displayed and the objects to be matched are the same; i.e., all 1" cubes, or all oval beads. The task becomes more difficult when the two sets of objects are of different sizes and shapes. Display red, blue, yellow small triangular blocks.
   Give the child red, blue, and yellow large thick circles to match with the triangles.

   By providing other distracting factors, such as thickness, size and shape, the task of matching colors becomes more complex. The child must ignore the distractors and pay attention to the color to complete the task.
   For children who are distractible, begin with objects that are the same size, shape, etc., gradually adding more distractors until the child is able to do the task no matter how many other distractible features the objects might have.

Visual Analysis
G.O.II S.O.1

*Sensory-Motor Integration
G.O.III S.O.2

Attention Task

General Objective IIb: To scan by systematically focusing on one or more distinct features of several objects one at a time.

Combination:

Short Presentation	Random Order
Visual Modality	Recognition
Representative	Sensory-Motor

Materials

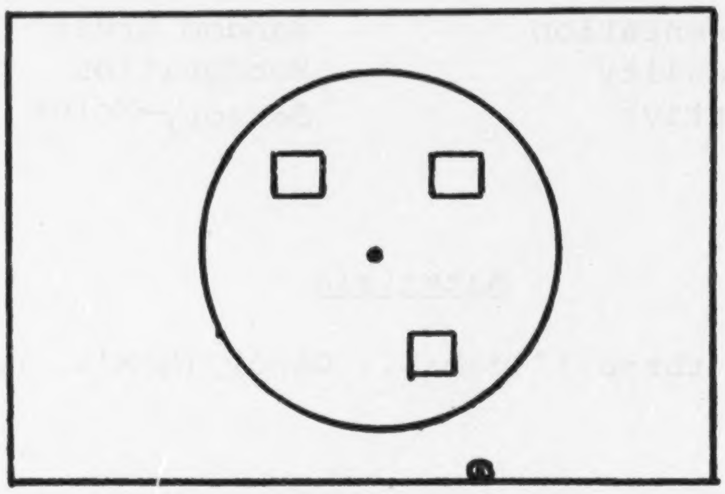
Record Player, three 1" cubes. Candy (M&M's, hard candy), etc.

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this SMI objective before he can be expected to attempt the Visual Analysis Objective.

Visual Analysis G.O.II S.O.1
*Sensory-Motor Integration G.O.III S.O.2

Activity

Position the record player so that you are sure the child can look down at the turntable.
Place 3 different-colored 1" cubes on the turntable e.g., green, orange, blue.
Keep a duplicate set of the 3 cubes as your presentation model.
Indicate the place at which the child is allowed to remove the cube with a marker on the record player case. (Be sure the marker is visible and directly in front of the child.)



Start the record player at the lowest speed.
Demonstrate the task for the child.
Hold up a green cube from the demonstration set, so that the child sees it.
Remove the matching green cube from the turntable when it rotates to the marker.
Stop the machine and replace the cube on the turntable.
When the child understands the task have him do it.
Hold up the green cube from the demonstration set for the child to view for a period shorter than 5 seconds.
Have him remove the matching cube from the moving turntable when it reaches the marker.
If the child masters the task you can gradually increase the speed of the turntable.
Continue the task using all the colors.
Use M and M's or hard candy drops instead of the colored one-inch cubes.

To Make Task More Difficult, change the combination in the following way:

Make X's on the turntable with masking tape.
After the child has correctly retrieved the cube (as previously described) have him replace it on the exposed X while the turntable is moving.
Place the cubes over X's.
Increase the number of blocks.

Visual Analysis G.O.II S.O.1
*Sensory Motor Integration G.O.I S.O.6 a and b

Memory Task

Combination:

Long Presentation	Specific Order
Visual Modality	Reproduction
3 Units	Sensory-Motor

Materials

Set of colored nuts and bolts.

Activity

Select 6 colored bolts -- 2 of each color so that you will have 3 colors to use as your model (e.g., 2 red, 2 yellows, 2 blues).
Take 3 nuts, one of each color, and twist them onto the bolt. Have the child view the array for a period longer than 5 seconds.
Cover over your display so that it is no longer in view.
Hand the child the 3 nuts and have him twist on the nuts in the same order as those he has just seen.
After he has completed this task, uncover your model.
Have the child check his response against the model.

To Make the Task Easier, change the combination in the following ways:

Number of Units. Reduce the number of nuts used.

Random Order. Have the child screw on the nuts without regard to specific order.

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this S-M-I objective before he can be expected to attempt the Visual Analysis Objective.

Visual Analysis
G.O.II S.O.1

Sensory Motor Integration
G.O.I S.O.6 a and b

To Make The Task More Difficult, change the combination in the following ways:

Number of Units. Increase the number of units.

Level of Representation. Across the level of representation, show the child 3 colored blocks and have him reproduce the color sequence using the colored nuts and bolts. To maintain attention and to provide the child with novelty when using the same material, you might try to introduce a Gross Motor exercise (e.g., place the unscrewed nuts and bolts around the room).
Have the child retrieve the matching parts and put them together.
A similar memory task can be devised for Sensory-Motor Integration, G.O. I, S.O. 8 and S.O. 9, using the designated materials.

Specific Objective 2: To match an array of shades of one color:

a. to match an array of up to three shades of one color;

b. to match an array of four or more shades of one color.

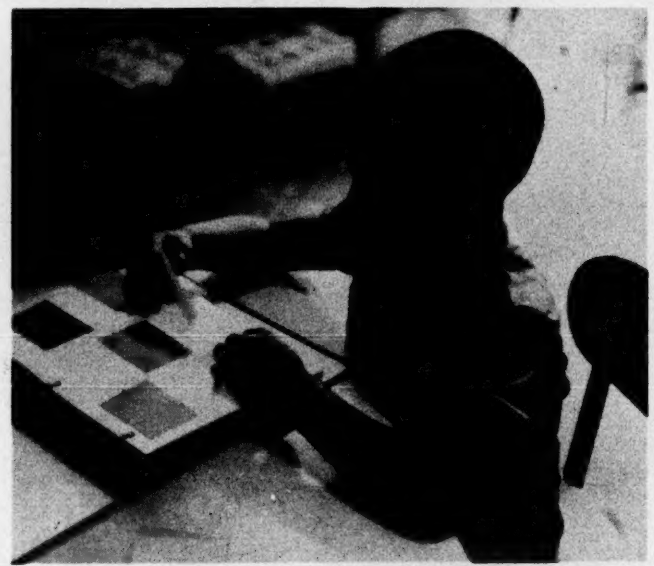
Materials

Duplicate sets of color samples. You can make a color matching notebook by pasting one color sample on the face of a piece of lightweight cardboard and placing the duplicate of that sample in an envelope that has been pasted on the back of the cardboard. Make the task easy by pasting few (2 to 3) samples per page. Make the task more difficult by pasting 4 or more samples per page.

Activities

1. To demonstrate the task, match two sets of colors. Give the duplicates to the child and have him match the colors.
   Continue in this manner until the child is able to match three shades of one color.

2. When he is able to match three shades of one color, have the child match five shades of one color.



General Objective III: To develop the ability to match two-dimensional representations (photographs, drawings and figures).

Specific Objective 1: To match a two-dimensional representation of an object with another two-dimensional representation of that object:

a. to match colored pictures;

b. to match black-and-white pictures;

c. to match drawings.

Materials

Duplicate sets of a variety of colored and black-and-white pictures and drawings. You can use magazine pictures, photographs, playing cards, storybook illustrations, etc.

Activities

1. (For S.O. 1a)
Place 2 or 3 colored pictures in front of the child.
Demonstrate the activity for the child by placing the matching pictures together.
Give him the matching pictures.
Have him place the matching cards together.
If the objects are very different (an animal, pieces of furniture, dolls) the task will be easier than if the pictures he must match look quite similar, e.g., all birds, or all people.

2. (For S.O. la)
If the child is confused by the quantity of cards, hand him one picture at a time and have him find the matching picture.
If the child is still unable to do this activity, point out the similarities in the matching pictures, e.g., the contour, the distinct parts in the picture, the color, etc.

3. (For S.O. la)
Gradually increase the number of pictures displayed until the child can readily match 8 to 10 pictures.

4. (For S.O. lb)
Follow the procedure in Activity #1 above, this time using black-and-white pictures.

5. (For S.O. lc)
Follow the procedure in Activity #1 above, this time using a more abstract two-dimensional representation of an object, e.g., a drawing.

Memory Task

Combination:

Short Presentation	Representative
Visual Modality	Recognition
1 Unit	Sensory-Motor

Materials

A variety of 2-dimensional material, several of which have some similar characteristics, Include also a variety with different characteristics, e.g., deck of playing cards, magazine photographs, flashcards with words or letters.

Activity

This activity may be played with only one child or with a small group of children.
Show the child a diamond on the playing cards (or some other designated picture or letter).
Have the child go through the deck of playing cards and select all the diamonds.
Mix up the playing cards.
Turn each card over so that the card face can be viewed.
When a diamond is exposed slap it and tell the child that he should do the same when the next diamond appears.
To maintain interest keep changing the designated pattern on the cards.

To Make Task Easier, change the combination in the following ways:

For the child who has difficulty remembering the designated card, you can begin to foster memory skills by leaving a sample visible for him to refer to, e.g., draw a diamond and color it red. Tell the child that when a card with this symbol on it appears, he should slap it. Observe the number of times the child refers to the model. When he no longer refers to the model, remove it from view to see if the child can continue the activity without the model.

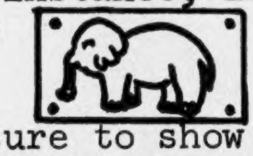
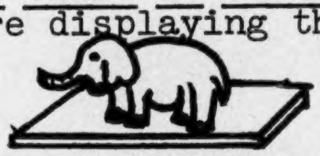
General Objective IV: To develop the ability to match a three-dimensional object with a two-dimensional representation of that object.

Specific Objective 1: To match a three-dimensional object with a color photograph of that object.

Materials

A variety of three-dimensional objects and color photographs of those objects taken from different angles, e.g., full face, side view, rear view, aerial view, diagonal view. Photographs of objects which are quite similar, e.g., hippopotamus and rhinoceros, two chairs, etc., are more difficult to match than objects which are not at all alike. Use photographs of objects that are familiar to the children, such as the classroom furniture, milk containers, etc.

Activities

1. Display two three-dimensional objects.
   Show the child a photograph of one of the objects making sure that it is a photograph in the same perspective from which the child is seeing the object.
   For instance, if you are displaying the elephant sideways   be sure to show the side-view picture of the elephant.
   Demonstrate the activity for the child by matching object with photograph.
   Give the child the picture and ask him to put it next to the three-dimensional model.
   If the child is unable to do the activity, point out the common characteristics between the object and the picture; with an elephant you might point out the trunk, the ears, the thick legs, small tail and so on.

2. Increase the number of objects, making sure that the photograph is in the same perspective from which the child is seeing the object.

3. Reverse the procedure and display several photographs. Ask the child to choose the objects that he sees in the photographs and place them next to and in the same perspective as the photographs.

For additional activities in matching in different perspectives, see Conceptualization, G.O. IV, S.O. 3.

Specific Objective 2: To match a three-dimensional object with a black-and-white photograph of that object.

Materials

A variety of three-dimensional objects and black-and-white photographs of those objects taken from different angles.

Activities

The instructions for these activities are identical with those in S.O. 1, matching colored photographs with three-dimensional objects. See page VA-11. In fulfilling this objective you will be using black-and-white photographs.

For additional activities in matching pictures of objects in varying perspectives see Conceptualization, G.O. IV, S.O. 3.

Specific Objective 3: To match a three-dimensional object with a drawn representation of that object.

Materials

A variety of three-dimensional objects and drawings of those objects. The three-dimensional objects and the drawings should both be as identical in their characteristics as possible so that the child need only match the characteristics rather than define a class.

Activities

1. Place the three-dimensional objects -- animals, geometric solids, etc. in front of the child. Give the child the colored drawings of the objects and have him match the drawings to the actual objects.
2. Follow the same procedure as in Activity #1 above, this time using more abstract black-and-white drawings, and geometric solids with pictures of geometric shapes.

Memory Task

Combination:

Long Presentation	Abstract
Visual Modality	Specific Order
Tactile Modality	Gross Motor
3 Units	

Materials

Squares, (5X5) with numbers or letters written on them. The squares should be of a sturdy material, such as wood, cardboard, etc., so they can be stepped on. Three-dimensional numbers.

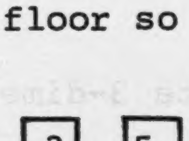
Duplicate sets of color samples, material squares or geometric shapes. Mount the sample on lightweight cardboard and use these to step on. The duplicate of the sample can be used to make a sequence.

Activity

Select 3 numbered squares and the corresponding 3-dimensional numbers, e.g., 3, 8, 5.

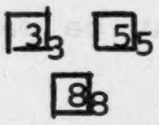
Place the squares on the floor so that each number can be easily stepped on:

e.g.



Place the corresponding 3-dimensional numbers next to the numbered squares.

e.g.



Indicate that the numbers are the same, e.g., $\boxed{3}$ on the square is the same as the 3-dimensional $\boxed{3}$.

Have the child trace the 3-dimensional block 3 and the 3 that appears on the square with his finger.
Once the child understands the correspondence between the numbers on the square and the 3-dimensional numbers move the 3-dimensional numbers from the floor and place them in a row on a table, e.g.

835

Demonstrate by stepping on the numbered squares in the same order as the 3-dimensional numbers, as they appear on the table. In this case first step on the 8, then the 3, then the 5.

When you feel that the child understands what is expected of him, reorder the tactile numbers.

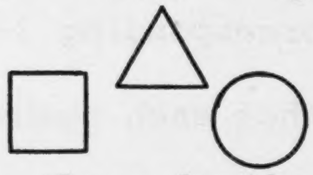
538

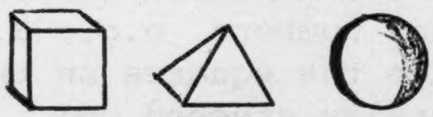
Have the child step on the squares: first the 5, then the 3, then the 8, to correspond to the sequence of the wooden numbers.

To Make Task Easier, change the combination in the following way:

Number of Units. Use fewer units (numbers or shapes).

Level of Representation. Instead of using numbers use a more concrete item, such as a cardboard geometric shape. Place a square, a triangle, a circle on the floor.





Place these duplicate 3-dimensional forms in a row on the table.
Have the child step on the appropriate forms to correspond to the order of the three-dimensional forms that you have set up on the table.
The same activity may be performed with varied materials.

General Objective V: To develop the ability to assemble three-dimensional materials to match a three-dimensional model.

Specific Objective 1: To assemble pieces of an object to match the real object:

a. to assemble an object having up to three pieces;

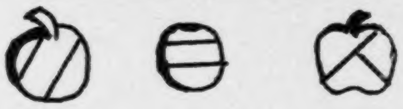
b. to assemble an object having four or more pieces.

Materials

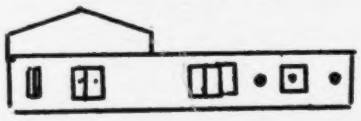
Any three-dimensional objects that can be taken apart and put back together again, such as fruit, block houses, snap-together blocks, etc.

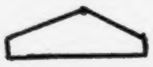
Activities

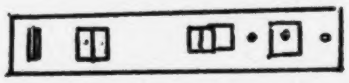
1. (For S.O. 1a)
Cut up one orange (apple) into three parts.
Display the whole orange (apple) as a model.
Have the child put the three pieces together so that it looks like the uncut model.
You can cut the fruit in many different ways; e.g.,



2. (For S.O. 1a)
Display a three piece model of a house, car, animal, etc.
Give the child the pieces that the model is made up of.







Have him make his own model using the pieces.
If the child is unable to make the model, build the structure for him omitting the last piece.
Have him place the last piece.
When the child is able to reproduce a model given the exact number of parts, give him more parts than he will need so that he must visually analyze which pieces he will have to use to duplicate the model.

3. (For S.O. 1b)
When he is able to reproduce a model with two or three components, have him reproduce models with four or more components.

Specific Objective 2: To assemble pieces of a geometric form:

a. to assemble a geometric form having up to three pieces;

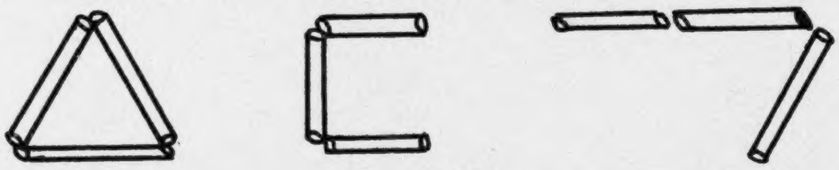
b. to assemble a geometric form having four or more pieces.

Materials

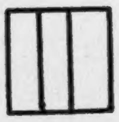
Any small objects which can be arranged to make a geometric figure, such as pegs, cardboard, wooden or rubber shapes. To keep the pegs from rolling, place them on a piece of felt or other cloth.

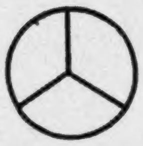
Activities

1. (For S.O. 2a)
   Place three pegs on a cloth in a geometric pattern.
   Give the child three pegs and have him reproduce the pattern.
   If the child is unable to duplicate the model, build it for him omitting the last piece.
   Have him place the last piece to finish the form.
   Have him reproduce several patterns.

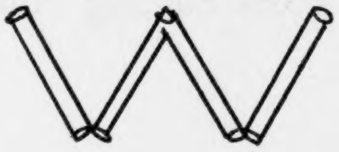


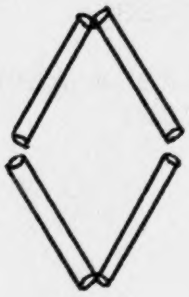
2. (For S.O. 2a)
   Make a geometric figure using two or three components.
   Have the child reproduce the form using the form you have made as a model.
   If the child is unable to do the activity, make the figure for him and allow him to place the last piece.
   Do this activity in conjunction with Visual Analysis, G.O. IX, S.O. 1.





3. (For S.O. 2b)
When the child is able to reproduce patterns with three components have the child reproduce patterns with four or more components.





Specific Objective 3: To assemble a complex pattern:

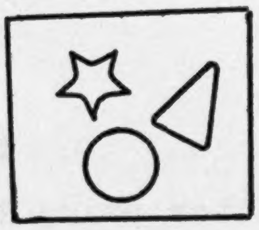
a. to assemble a complex pattern having up to three pieces;

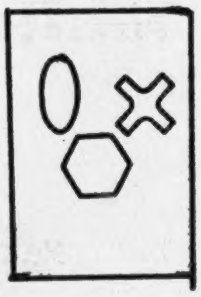
b. to assemble a complex pattern having four or more pieces.

Materials

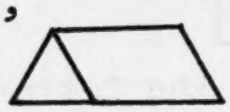
A variety of small two-dimensional pieces that can be assembled to make a complex pattern; geometric forms, regular and irregular shapes made of plastic, cardboard, rubber or wood might be used.

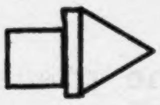
Activities

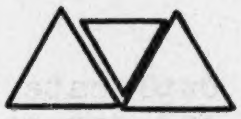




1. (For S.O. 3a)
Place two or three colored shapes in a particular pattern.
Give the child the matching pieces and have him reproduce the pattern.
This activity may also be done with geometric forms, e.g.,







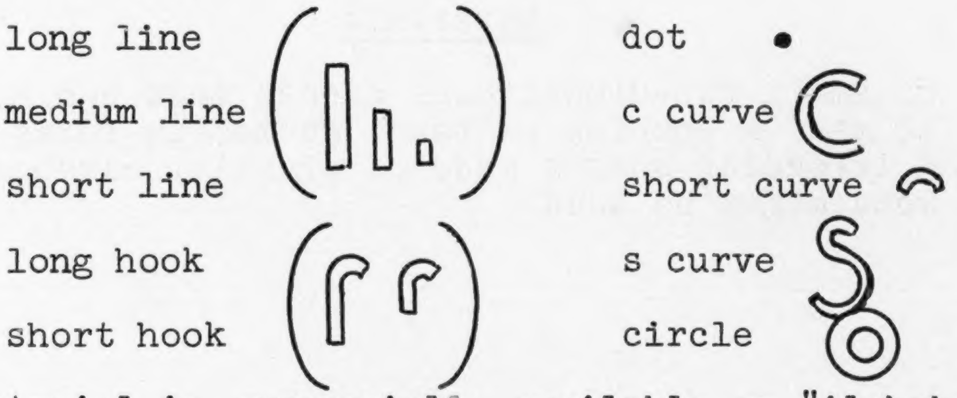
If the child is unable to reproduce the pattern, have him place the matching pieces directly on top of the model, then move them beneath the pattern.
To increase the difficulty of the task use pieces of all one color.

2. (For S.O. 3b)
Follow the same procedure as above, using four or more geometric forms, regular and irregular shapes.

Specific Objective 4: To assemble a letter from manipulable two-dimensional pieces.

Materials

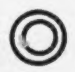
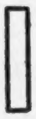
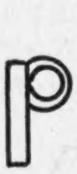
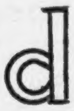
Cut out pieces of fabric or plastic so that the lower case alphabet letters can be made from them. The ten different shapes needed are:



This material is commercially available as "Alphabet Puzzle".

Activities

1. Make a letter using two shapes.

You might use  and  to make a  or a ,etc.

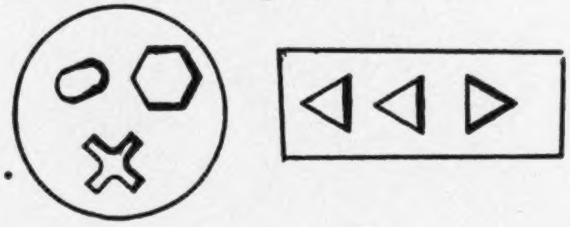
Display a duplicate set of the pieces of the letter you have made and several other pieces.
Have the child select the appropriate components and reproduce the letters.
If you are using pliable material be sure to place them on a sturdy backing.
If the child is unable to do this task,help him to analyze the components by taking the letter apart and describing each piece.
Have the child touch the pieces.
Present him with another letter.
Have him describe the components and pick them out.
Then have him put the letter together.
By breaking down the process of reproducing the letter, you can see just where the child is having difficulty and at what phase he will need more help.

General Objective VI: To develop the ability to match an inset with its matching outline.

Specific Objective 1: To develop the ability to predict which three-dimensional inset of a shape will fit into the outline of that shape.

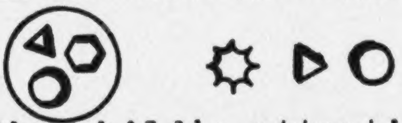
Materials

Any puzzle where the pieces are discrete from one another;—e.g., each piece fits into its own space which is defined by a surrounding.
You can make these out of cardboard, sandpaper, etc.
The "Discovery Tower" can also be used to fulfill this objective.



Activities

1. Place a puzzle with only two shapes missing in front of the child.
   Place two of the missing inserts and another piece that will not fit in front of the child.

   Direct the child's attention to one of the empty spaces in the puzzle.
   Ask him to point to the insert that will fit into that space in the puzzle.
   Each time he predicts one that will fit, have the child check to see if his prediction was correct by trying to place the insert into the space.

2. Place a puzzle with three or more inserts missing in front of the child. Place the missing inserts and a few inserts that will not fit into that puzzle in front of the child. Have him predict which insert fits a space and check to see if his prediction was correct.

3. Place the base and the next two sections of the "Discovery Tower"on a table.
Point to the one post of the base.
Show the child the one hole on the section that fits on top of the base.
Place that section on the base.
Draw the child's attention to the two posts of the next piece.
Ask him to place the third section on the tower.
Place the next three sections on the table.
Draw the child's attention to the three posts.
Direct the child's attention to the holes.
Have him find and place the sections to complete the "Discovery Tower."

Visual Analysis

G.O.VI S.O.1

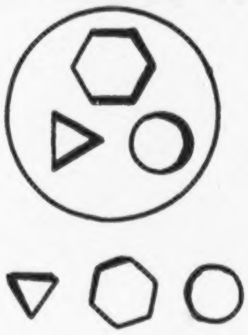
Memory Task

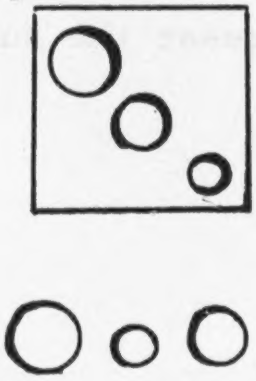
Combination:

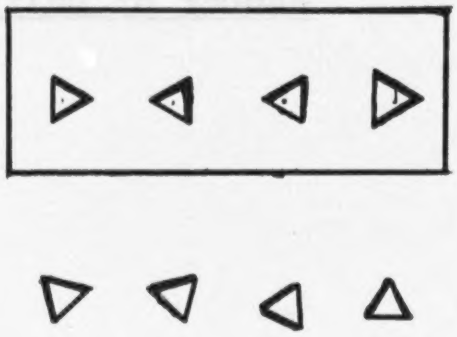
Short Presentation
Visual Modality
2 Units
Abstract Material
Specific Order
Reproduction
Sensory-Motor

Materials

Any puzzle where the pieces are discrete from one another, e.g., each piece fits into its own space which is defined by its surrounding.







Activity

Select a puzzle and remove the pieces.
Place the pieces in a row in front of the child for a short period of time.
Cover the pieces with a paper so that they are no longer seen by the child.
Give the child 3 empty puzzles, one of which will hold the pieces the child has seen.
Have him select the puzzle that would hold the pieces that he has just seen.
Remove your cover and have him check his responses.

To Make the Task Easier, change the combination in the following way:

Length of Presentation. Allow the child to view the pieces for a longer period of time.

Sensory Modality. Allow the child to feel the pieces as well as view them.

Number of Units. Begin with 2 choices. Try the pieces before him in the outlines. Point out the incongruity of the pieces with the wrong outlines.

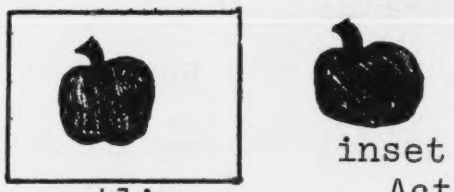
To Make the Task More Difficult, change the combination in the following way:

Number of Units. Increase the number of pieces used.

Specific Objective 2: To predict which two-dimensional inset will fit into the outline of that shape.

Materials

Silhouettes of children, body parts, objects, geometrical shapes. Refer to "Lights and Shadows"—Teacher's Guide for instructions in making silhouettes. Cut out the silhouetted figure in one piece thus making the inset. The remaining piece is the outline.
Commercially available materials appropriate for this objective are "We Study Word Shapes" and "Positive-Negative".



Activities

1. Make a profile silhouette of several children.
   Display one of the silhouettes and have the children guess which child it is.

2. Make silhouettes of the children's body parts; hands, legs, arms.
   Display one of the silhouettes and have the children point to that body part on their own bodies.

3. Draw a silhouette of several objects and geometric solids.
   Select one silhouette.
   Display several geometric solids and objects, one of which is the same as the silhouette.
   Ask the child to identify the object that is the same as the silhouette.

   To check to see if the child is correct, match the silhouette of the object he chose with the appropriate drawing.

4. Match a silhouette of an object or person to a picture of an object or person.

5. Place two insets and the matching outlines in front of the child.
   Direct the child's attention to the contour of the inset.
   Have him select the inset that he thinks will fit into one of the outlines.
   Have him place the inset to see if he was correct.

6. Increase the number of insets and matching outlines.

7. Choose two pictures from "Positive-Negative" that require only two components to make a whole.
   Place the two negatives in front of the child.
   Show him one of the positives and ask him which negative goes with that positive.

   To see if he is correct place the positive over the negative.
   If they match put them aside, choose another set of pictures, and go on.

   Further instructions as to how to play "Positive-Negative" can be found in the box.

VA-25

Visual Analysis
G.O.VI S.O.2

*Sensory-Motor Integration
G.O.VII S.O.2d

Conceptualization
G.O.III S.O.2

Attention Task

General Objective I: To focus on one distinct feature of one object.

Combination:

Short Presentation
Visual Modality
1 Unit

Concrete
Reproduction
Gross Motor

Materials

Silhouettes of arms, legs, head, hand, etc.; overhead projector.

Activity

Place a silhouette in the overhead projector.
Cover the silhouette before turning the projector on.
Tell the child to watch carefully.
Uncover and project the silhouette for less than 5 seconds.
Ask the child to touch the body part, on another child or himself, that matches the silhouette.

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this SMI objective before he can be expected to attempt the Visual Analysis Objective.

Visual Analysis G.O.VI S.O.2
Sensory-Motor Integration G.O.VII S.O.2d
Conceptualization G.O.III S.O.2

NOTE: The procedure described here may be used with other materials. You might flash geometric figures, pictures or letters. A duplicate of the element flashed should be placed in front of the child with other choices. His task is to select the one flashed. This activity can also be used in conjunction with Conceptualization, G.O.III, S.O.2.

Memory Task

Combination:

Short Presentation	Across Levels of Representation
Visual Modality	Recognition
2 Units	Sensory-Motor

Materials

Silhouettes of children, body parts, objects, geometrical shapes, letters or numbers.

Any three-dimensional objects e.g., book, eraser, paint brush, etc.

Activity

Select a silhouette and 3 three-dimensional objects, one of which is the same as the silhouette.
Show the child the silhouette for a short period of time.
Remove the silhouette from view.
Place the 3 objects in front of the child.
Have him select the object that corresponds to the silhouette.
Have him check to see if he was correct.

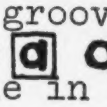
To Make This Task Easier, change the combination in the following ways:

Length of Presentation. Increase the amount of time the child has to view the silhouettes.

Level of Representation. Reverse the procedure by showing the child one object. Have him choose from among two or three silhouettes, the silhouette of the object he has seen.

Specific Objective 3: To predict which three-dimensional inset of a written symbol (alphabet letter or number) will fit into the outline of that symbol.

Materials

Three-dimensional letter or numeral insets with corresponding grooved blocks in the shape of the letters and numerals . Materials such as these are commercially available in wood and rubber.

Activities

1. Place 2 or 3 three-dimensional alphabet or numeral blocks in front of the child.
   Remove the insets.
   Show the child one inset, letting him feel it if he wishes.
   Place the correct letter or numeral into the block.
   Draw the child's attention to the similarities of the positive and negative of a letter or numeral, e.g., the positive of the letter "b" has a long straight line and a round part and so does the negative of that letter, and so on.
   Remove the insets and allow the child to do the activity.
   Have him point to the block that he thinks the letter or numeral will fit into.
   Let him check to see if he was correct by trying to place the letter or numeral into the block.

2. This activity can be made more challenging by increasing the number of blocks and by using letters that are similar, e.g., u, n, m or p, b, d.
3. Try this activity using both capital and lower-case letters together.
4. Try this activity using both alphabet letters and numerals, e.g., the letter S and numeral 5, the letter L and numeral 7.

Memory Task

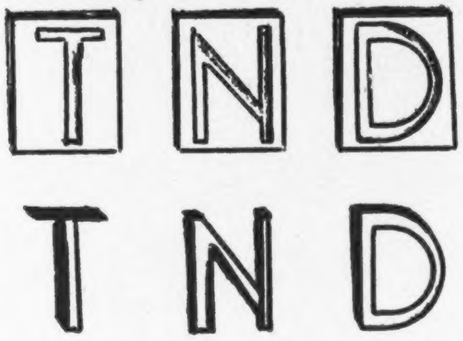
Combination:

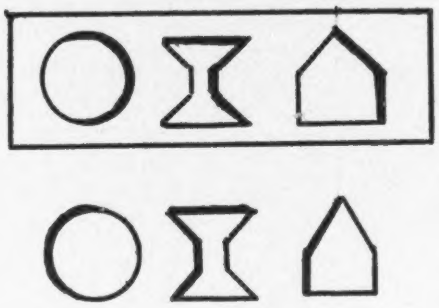
Short Presentation
Cross Modalities
2 Units
Abstract Material

Random Order
Reproduction
Sensory-Motor

Materials

Three-dimensional letters or numbers which are discrete from one another, each piece of which fits into its own space.
Any puzzle where the pieces are discrete from one another, e.g., each piece fits into its own space which is defined by its surrounding.





Activity

Select 2 three-dimensional letters and remove the letters.
Place the letters in a row in front of the child while he has his eyes closed or, if he permits, blindfold him.
Direct his hands to the letters and have him totally explore them for a short period of time, keeping his eyes shut.
Cover the letters with a paper so that when the child opens his eyes the letters will be out of view.
Give the child 3 of the surrounding outlines for the letters, 2 outlines of which correspond to the letters the child has felt.

Have him point to the 2 outlines that he predicts will match the letters that he has just felt.
Uncover the letters and allow the child to fit the letters into the outlines to see if his choice was correct.

To Make Task Easier, change the combination in the following ways:

Number of Units. Have the child feel only one letter.

Length of Presentation. Increase the amount of time that the child has to feel the material.

Sensory Modality. Allow the child to see and feel the letters and (you) name them for him.

Level of Representation. Begin by doing the activity with simple shapes and their outlines.

Specific Objective 4: To match letters, numbers and words to the outline of those letters, numbers and words.

Materials

Draw outlines of letters, numbers and words.

This objective can be fulfilled with material such as "We Study Word Shapes."

Activities

1. Give the child three cut-out letters and one outline of a letter.
   Have the child predict which letter will fit into the outline you have drawn.
   Have him place the letter into the outline to check to see if he was correct.

2. When the child succeeds in choosing cut-out letters, have him predict which printed letters will fit into the outlines.

3. Follow the above procedure using numbers and words.

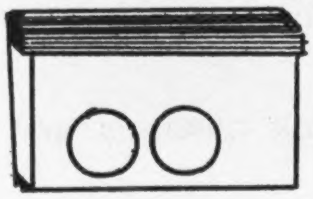
General Objective VII: To develop the correspondence between a tactile perception of an object and its visual representation.

Specific Objective 1: To match a tactile-kinesthetically perceived object with that three-dimensional object.

Materials

Duplicate sets of three-dimensional solids, objects and textured materials, such as sandpaper, color, fur, sponge, rocks, etc.

Make a What Is It? box by cutting holes out of one side of a box that has a removable top.



Activities

1. Place one object in the What Is It? box.
   Place two objects, one which is the same as the one in the box on the table.
   Have the child feel the object in the box. (Make sure he doesn't peek into the box!)
   Ask him to identify from the choices on the table which object he felt.

2. This activity can be made more challenging by increasing the number of choices displayed on the table and by having the choices quite similar in shape and texture, i.e., bolt, screw, small pencil, peg, etc.

Visual Analysis
G.O.VII S.O.1

*Sensory Motor Integration
G.O.III S.O.1

Memory Task

Combination:

Long Presentation	Reproduction
Visual Modality	Random Order
Tactile Modality	Sensory-Motor
2 Units	

Materials

Clothesline and clothespins and any items that can be suspended from the line. Have duplicate of each item, e.g., geometric forms, articles of clothing, different colored squares.

Activity

Set up a clothesline.
Use clothespins to suspend geometric forms, e.g., triangle, square from the clothesline.
Have the child look at and feel the forms for a period longer than 5 seconds.
Place something over the clothesline to hide the forms from view.
Present the child with 3 forms, e.g., triangle, square and circle.
Have the child suspend the same 2 forms that you had clipped to the line.
Order need not be emphasized.

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this S-M-I objective before he can be expected to attempt the Visual Analysis Objective.

To Make The Task More Difficult, change the combination in the following ways:

Number of Units. Increase the number of forms used.

Level of Representation. Use abstract forms e.g., letters or representative materials like color pictures.

Specific Order. Have the child suspend the shapes in a specific order.

Memory Task

Combination:

Long Presentation	Random Order
Cross Modalities	Recognition
1 Unit	Sensory-Motor
Abstract	

Materials

Any 3-dimensional objects: geometric models, letters, numbers or common classroom objects, e.g., an eraser, a pencil, a book.

Activity

Select two different 3-dimensional objects.
Put one out of view and use the other.
Have the child close his eyes, or place the object in the "What Is It?" Box.
Have him feel the 3-dimensional object for a period of longer than 5 seconds.
Take the object from him before he opens his eyes or take it from the Box as he faces away.
Place the two objects together.
Have him touch and look while trying to select the correct object.
Do the same task using numerals, geometric shapes.

To Make Task Easier, change the combination in the following way:

Level of Representation. If child has not yet reached the level where he recognizes letters or shapes, use 3-dimensional objects that provide him with many tactile clues to their identity. Use objects that the child brings with him to school (clothing, pen, or pencil, etc.).

To Make the Task More Difficult, change the combination in the following ways:

Length of Presentation. Reduce the amount of time the child has to view the material.

Number of Units. Increase the number of units (letters, shapes, etc.).

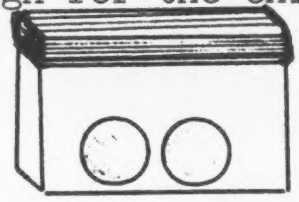
Specific Order. Require the child to recognize the materials in a specific order.

Specific Objective 2: To match a tactile-kinesthetically perceived object with a two-dimensional representation of that object.

Materials

Any three dimensional objects, geometric models or symbols and matching pictures or drawings; e.g., a model of an elephant and pictures or drawings of an elephant, a wooden block of the letter S and a printed letter S, etc.

Make a What Is It? box by cutting out holes on one side of a box that has a removable top. The holes should be large enough for the child's arms to slip through.



Activities

1. Place an object in the What Is It? box. Place the picture of the object that's inside the box on a table, along with another picture. Have the child feel the object in the box, then point to the picture of that object.

   To check to see if he was correct, have the child remove the object from the box and compare it with the picture he chose.

   If the child is unable to do this activity have him first feel what is in the box, then remove it from the box and match it to the picture. Be sure to begin by using objects that look and feel quite different; e.g., a circle and a triangle, an elephant and an alligator, the letter "O" and the letter "K."

2. This task can be made more challenging by increasing the number of pictures from which the child must choose and by using pictures of objects or symbols that look quite similar.

   For instance, if you placed a raised or three-dimensional letter **n** in the What Is It? box you might select as choices other letters from the printed symbols, $\boxed{n}$ $\boxed{m}$ $\boxed{n}$ $\boxed{r}$.

3. Show the child a picture of an object.
   Have him feel two or three objects in the What Is It? box, and choose the object that matches the picture he has seen.

General Objective VIII: To develop the ability to locate embedded figures.

Specific Objective 1: To locate a printed form embedded in an overlay:

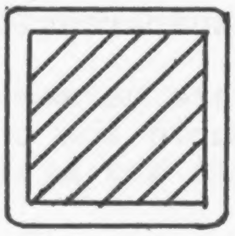
a. to locate a picture of an object embedded in an overlay;

b. to locate a geometric form embedded in an overlay;

c. to locate a symbol (a letter or a number) embedded in an overlay.

Materials

Make transparencies with geometric patterns printed on them. Make several transparencies with the same pattern, with the pattern more densely placed on each one. A wide variety of patterns is available commercially.

1.


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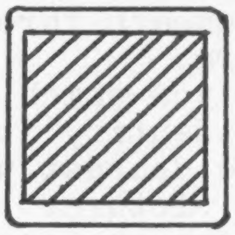
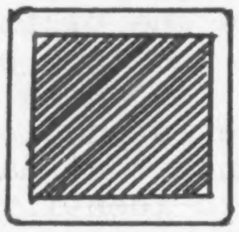
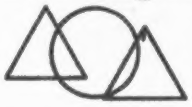
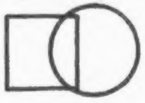


3.


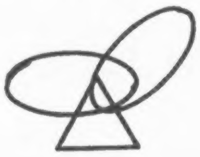
Make an Embedded Forms Book by pasting fabric samples on cardboard. Then paste wood or cardboard shapes on the fabric and place the duplicates of those shapes in an envelope which has been pasted on the back of the cardboard.

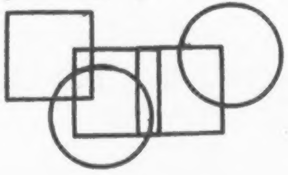
Make a series of drawings on dittos, of overlapping figures, using a template or form. Begin with two simple but different figures, such as a circle and square, or oval and triangle. Draw some figures so that one figure overlaps only one other figure, e.g.,

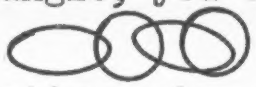
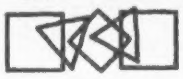




In more difficult drawings, one figure may overlap more than one other figure, e.g.,





By using similar figures, circle and oval, square, triangle and rectangle, you can make the task very difficult, e.g.,  

Follow the instructions above using letter and numeral shapes to fulfill S.O. 1c.

Activities

1. (For S.O. 1a)
   Show the child two different-colored pictures.
   Direct the child's attention to the distinctive features of each picture.
   Place one picture beneath three transparencies that have the same pattern.
   Have the child tell you which picture he sees.
   If he is unable to identify it, remove the transparency that has the densest pattern and again ask him to identify the picture.
   Continue to remove transparency layers until the child can identify the picture.

2. (For S.O. 1a)
   This activity may be adapted for a group by using an overhead projector.
   Have the children take turns in identifying the picture.

3. Follow the same procedure as in Activity #1 above, this time covering black-and-white line drawings with the transparencies.

4. Vary this activity by using the other transparency sets and by embedding a variety of pictures and drawings.

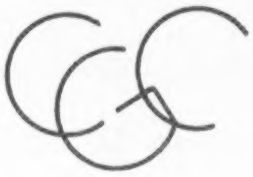
5. (For S.O. 1b)
   Follow the same procedures as in Activity #1 above, this time covering printed geometric forms and then line figures. Draw the child's finger over the shape before placing the shape under the overlay.
   Have the child trace the shape once it is under the overlay.

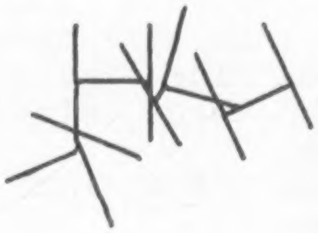
6. (For S.O. 1b)
   Remove the cardboard or wooden pieces from the envelopes on the backs of the pages in the Embedded Forms Book. Draw the child's attention to the contour of the forms by having him look at and touch them.
   Show him a page from the book.
   Demonstrate by placing one form on that matching form in the book.
   Have the child place the second form, using both tactile-kinesthetic and visual cues.
   Continue in this manner until the child can visually locate and match the embedded form in the distracting background without first feeling for the forms.

7. (For S.O. 1b)
   Give the child the template or form with which you have drawn the embedded figures.
   Allow him to feel the contour of the shape.
   Have him draw around the inside of the templates or around the outside of the form.
   Ask him to find the shape on the drawings you have made.
   Follow this procedure using the tactile-kinesthetic sensations until the child is able to find an embedded figure without first touching the template.
   Additional pages of embedded figures can be made using templates of any geometric figures and drawing them on dittos.

8. (For S.O. 1c)
Follow the same procedure as in Activity #1 above, this time covering over printed symbols. You might use letters or numbers printed with rubber stamps.

9. (For S.O. 1c)
Follow the same procedure as in Activity #7 above, this time using drawings of symbols which overlap each other.





Visual Analysis

G.O.VIII S.O.1b

Memory Task

Combination:

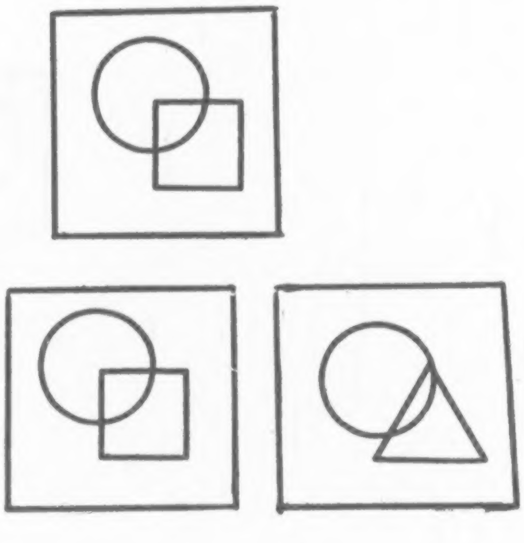
Long Presentation
Visual Modality
2 Units
Representative
Recognition
Sensory-Motor

Materials

Make a series of drawings of overlapping figures on dittos, using templates or forms. Begin with 2 simple but different figures, such as a circle and a triangle, e.g., . The templates or forms are also used in the activities.

Activity

Select two identical dittos and one different one.
Use one of your identical pair as the presentation model, the other for the choice model.
Hold up the presentation ditto, i.e., one of the identical pair for a period longer than 5 seconds.
Remove it from view.
Give the child the 2 choice model dittos, (i.e., the duplicate and a different ditto.)
Have him select the ditto that he was previously exposed to.

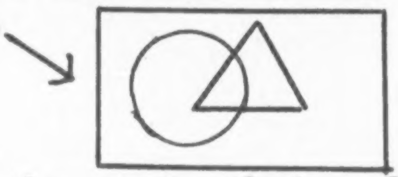


To Make Task Easier, if the child is distracted easily, for these tasks where the child's concentrated attention is required, we recommend that you select a corner of the room where distractibility is at a minimum. Sit face to face with the youngster and make a barrier on both sides of him so that peripheral distractions will be minimized and he will be focusing directly on you.

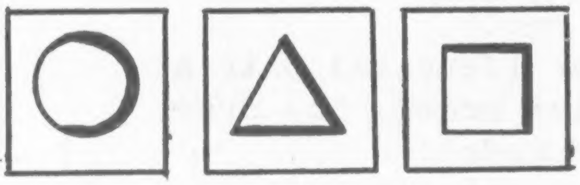
To Make the Task More Difficult, change the combination in the following ways:

Length of Presentation. Have the child view the dittos for a shorter period of time.

Recognition. Instead of presenting the youngster with ditto choices, present him with the components that were used to design that ditto, e.g., if you have shown the youngster this



ask him to select the parts that made up that ditto.



General Objective IX: To develop the ability to match printed forms.

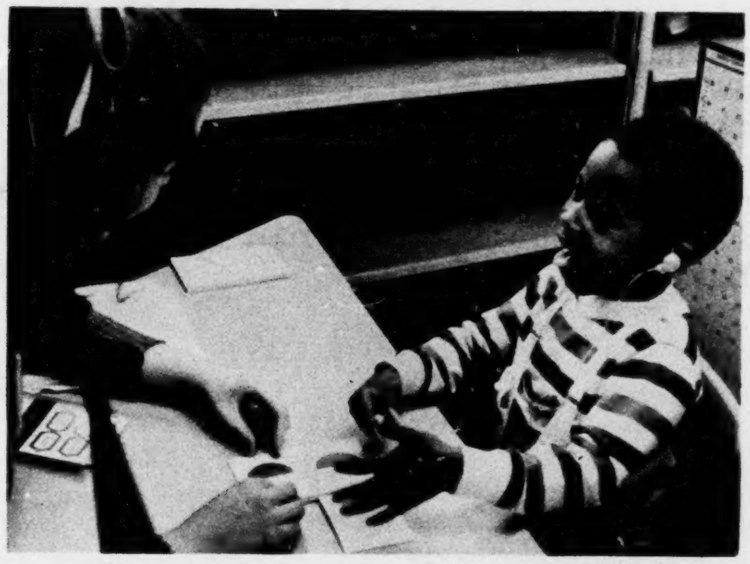
Specific Objective 1: To match single printed geometric figures.

Materials

Printed geometric figures.

Activities

1. Have the children match like shapes. If a child is unable to match like shapes be sure to point out and describe the features of the shape. If the child is not yet able to compare the shapes and match them, you should use a three-dimensional form so that the child can have the additional tactile-kinesthetic sensation.



Specific Objective 2: To match single printed symbols (letters and numbers):

a. to match symbols with other symbols;

b. to match symbols with transformations of those symbols.

Materials

Printed letters or numbers and transformations of those symbols.
Vary the materials by using symbols hand-printed on index cards, cut-outs from magazines, letters dry-transferred onto natural wood cubes, or from commercially available sources.

Activities

1. (For S.O. 2a)
   Display a printed letter or number.
   Draw your finger over the letter or number to point out its configuration.
   Draw the child's finger over the letter or number.
   Have the child find the matching symbol.
   Point out the matching configuration of the symbol.
   Once the child matches like symbols, again point out the likeness in the characteristics of the letters.

2. (For S.O. 2a)
   If the child is not yet able to match printed letters, first have him match the three-dimensional letters.
   Then, draw his attention to the similar features between the three-dimensional letters and printed letters.
   When the child has understood that he is to identify all identical symbols, allow him to find all matching letters himself.

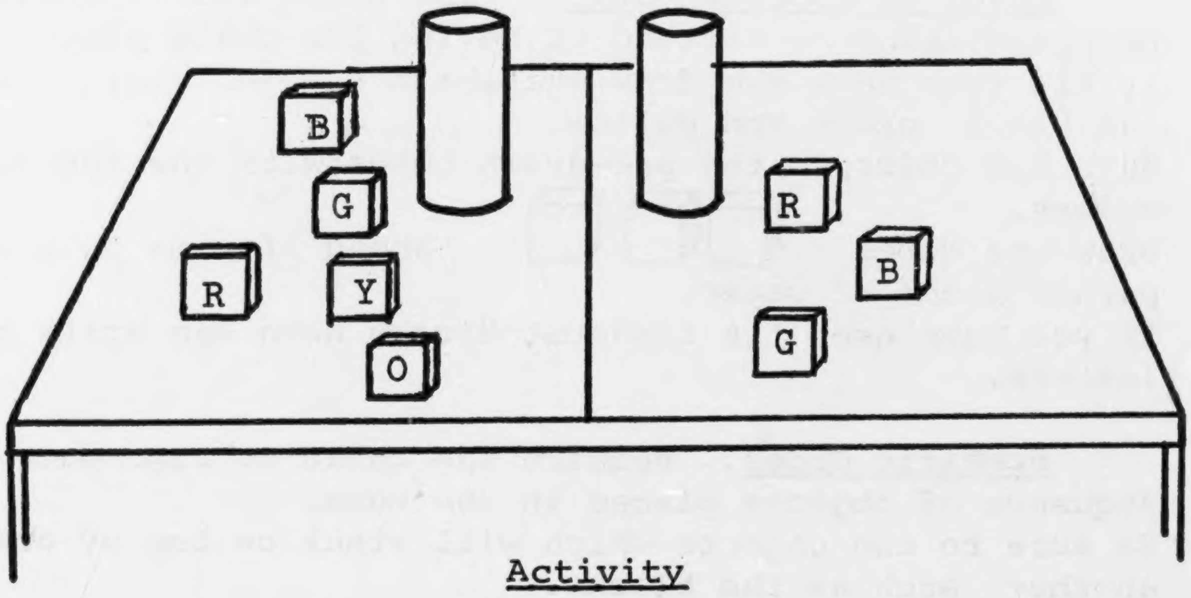
Memory Task

Combination:

Long Presentation	Abstract
Visual Modality	Random Order
Auditory Modality	Reproduction
3 Units	Sensory-Motor

Materials

Two pieces of opaque plastic tubing or 2 paper tubes. Any 3-dimensional material (in duplicate) which can be inserted into the plastic or paper tubes, e.g., beads, blocks, geometrical forms, blocks with letters printed on them, etc.



Activity

Select a set of 3 colored blocks. This is the Teacher's Set.
Select a second set, 3 duplicates of the Teacher's Set and two different blocks. This is the child's set.
Select one of the blocks and show it to the child for a period of longer than 5 seconds, while naming the color.
After you have displayed the block, put it in the tube.
After you have done this with all three of the blocks, place the Child's Set (5 blocks) in front of him.
Ask him to select and place in his tube the 3 colors that you placed in yours.
Remove the tubes and have the child compare both sets of blocks.

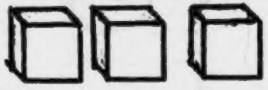
To Make the Task Easier, change the combination in the following ways:

Number of Units. To simplify the choice to be made, reduce the number of units, e.g., place 2 red blocks in the tube and present the child with 2 reds and 2 blues. Ask him to select and place the 2 colors that you placed in your tube.

Level of Representation. This activity may be repeated with any kind of object-common objects, geometric forms, letter blocks, etc.

To Make the Task More Difficult, change the combination in the following ways:

Number of Units. Increase number of units.

Level of Representation. Introduce across levels of representation -- instead of having the child place objects in his tube have him draw what he has seen, i.e., place a red block, green and yellow.
Have him color in the pre-drawn cubes with the appropriate colors.
Draw the cubes  ahead of time on a separate piece of paper.
If you have used the alphabet blocks have him write those letters.

Specific Order. Require the child to reproduce the sequence of objects placed in the tube.
Be sure to use objects which will stack on top of one another, such as the blocks.
Otherwise the objects will just fall into the tube and when the tube is removed there will be a random pile.
The child will not be able to see a specific order either in your model or his copy of the model.

Visual Analysis
G.O.IX S.O.2

*Sensory Motor Integration
G.O.I S.O.1

Memory Task

Combination:

Long Presentation	Abstract
Visual Modality	Random Order
Auditory Modality	Reproduction
Kinesthetic Modality	Sensory-Motor
2 Units	

Materials

Three- dimensional alphabet or numeral blocks, pencil, paper, typewriter.

Activity

Select 2 three-dimensional alphabet letters (numbers).
Use the case of letter that the child will be typing in, i.e., capitals "M," "Q," etc. (Be sure that the type corresponds to the letters).
Show the child the letters (numbers).
Say each letter (number).
Have him feel each letter (number) for a period longer than 5 seconds.
Cover the letters (numbers) so that they are no longer in sight.
Then have the child type the letters (numbers) he has just seen.
Have him compare his typewritten letters (numbers) to the three-dimensional letters (numbers).

*Where a Sensory-Motor Integration General Objective is noted, the child must have demonstrated a high level of mastery of this S-M-I objective before he can be expected to attempt the Visual Analysis Objective.

To Make Task More Difficult, change the combination in the following ways:

Length of Presentation. Have the child view the letters (numbers) for a shorter period of time before the begins to type.

Modality. Do not permit him to touch the letters (numbers). Have him look at them only.

Number of Units. Increase the number of letters (numbers).

Specific Objective 3: To match sets of geometric figures.

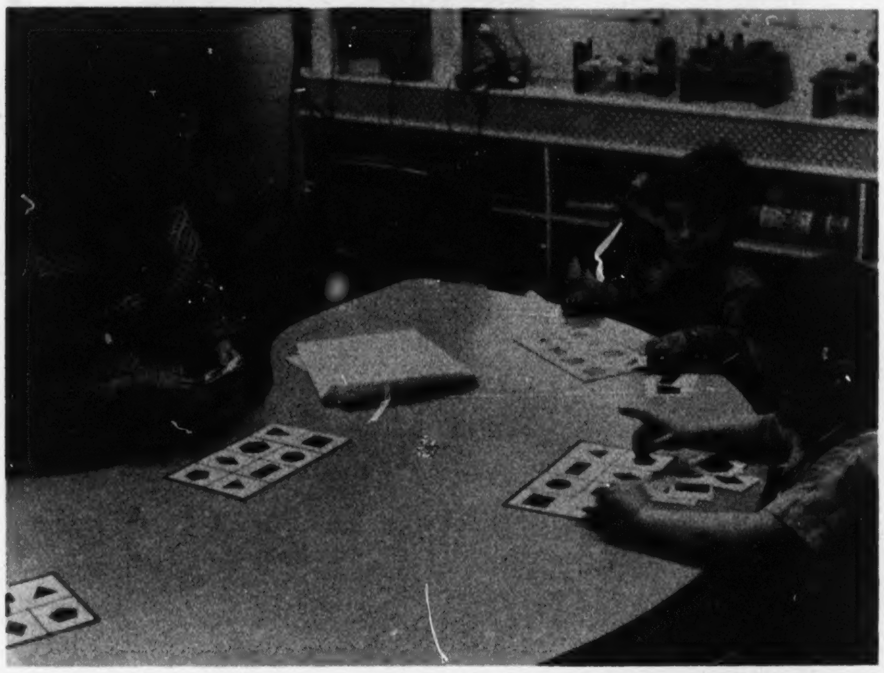
Materials

Groups of two or more printed geometric figures.
Make geometric figure groups by printing them on index cards with rubber stamps.

Activities

1. Display a group of geometric figures
   Point out the configuration of each individual figure in the group.
   Have the child select the matching group from among three choices.
   If the child's choice is incorrect, point to each individual figure in the group, comparing the child's choice with the model.

2. Increase the number of choices from which the child is to choose the group that matches the model.



3. If he is having difficulty in matching the sets by just scanning the pictures, it is necessary to help the child develop a systematic procedure for matching like cards.
   One systematic procedure might be to divide all sets by some criteria, e.g., all sets that contain the same number of figures, all sets that have the same figure on the left, etc. Then sort through each sub-set, sorting on the basis of another criterion. Continue in this manner until all identical cards are together.

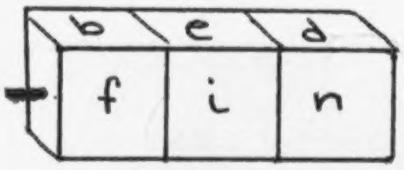
Specific Objective 4: To match sets of printed symbols:

a. to match sets of two to three symbols;

b. to match sets of four or more symbols.

Materials

Groups of two or more printed letters or numerals. Make symbol groups by printing letters and numbers on index cards with rubber stamps, or by printing letters on three or more large square beads and fastening the beads together with a round wooden stick.
To prevent the blocks from slipping off the stick, twist a rubber band around the ends.



Activities

In these activities the child is asked to match groups that are alike rather than reproduce them in writing.

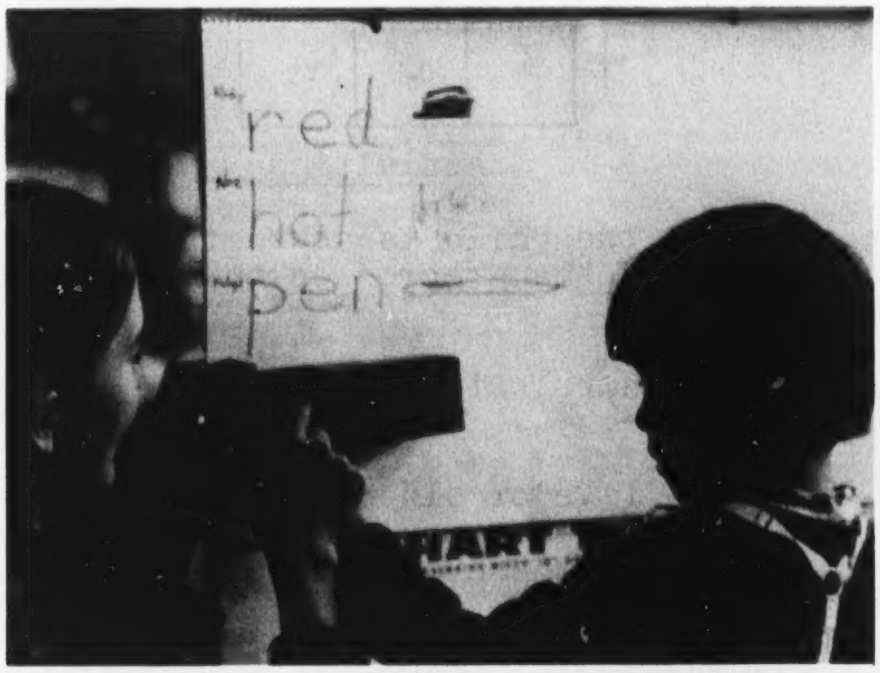
1. (For S.O. 4a)
Using rubber stamps, print two or three symbols on a sheet of paper.

   Give the child five or six rubber stamps.
   Have him choose the stamps for the symbols you printed and stamp those symbols directly beneath yours.
   By having his imprints beneath yours he can make a direct comparison.

2. (For S.O. 4a)
   If the child is unable to match the stamped symbol with the printed symbol on top of the rubber stamp, print the symbols on index cards and have the child match them to the model you have made.

3. (For S.O. 4a)
   Write three letters corresponding to a word from the joined beads (see instructions above) on a piece of paper or chalkboard.
   Give the child the beads.
   Have him reproduce the word you have written by twisting the beads around.

4. (For S.O. 4b)
   Follow the procedures given above, having the child match sets of four or more printed symbols.

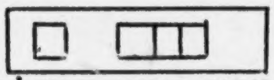
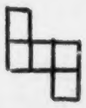
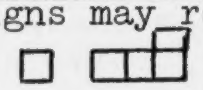


General Objective X: To develop the ability to duplicate the spatial organization of shapes and symbols. One of the most important features of written materials is the spacing between words. Children often ignore the spaces in reproducing words, thus making the task of reading more difficult. The following activities are designed to teach the child to attend to these necessary features without having the burden of writing them. Where letters and numerals are used they should be written ahead of time on cards by the teacher or obtained from commercially available sources.

For reproduction using a writing tool, please see Sensory-Motor Integration, General Objective XVI, Specific Objectives 3 and 4.

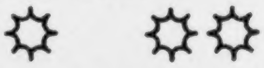
Specific Objective 1: To duplicate the spatial organization of three-dimensional objects and symbols.

Materials

Any small three-dimensional objects, such as crayons, chalk, erasers, geometric, alphabet or number blocks. Print designs of squares on cards which the child is to match with natural wood or colored 1" blocks,
e.g., 
The designs may represent words  (boy, tip) or phrases  (a hat).

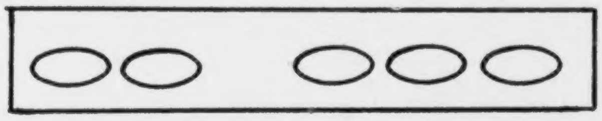
Materials such as these are available commercially ("Pre-Writing Designs").

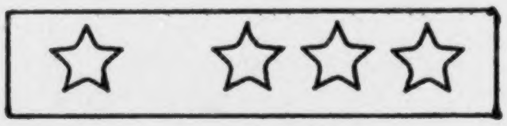
Activities

1. Place three objects on a table, one object about 4 inches away from the other two, e.g., 

   With a duplicate set of objects, copy the spatial organization of the objects.
   Draw the child's attention to the single object, the space and the two objects.
   Have the child copy the spatial organization of the model.

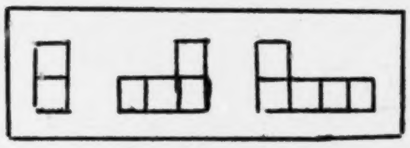
2. Increase the number of objects and the number of spaces; e.g.,



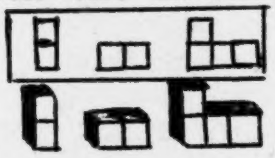


3. Follow the same procedure as described above, using three-dimensional alphabet or number blocks.

4. Have the child place the 1" square blocks on the printed square designs.



These activities are designed to help the child see the differences between tall and short areas and the spaces between groups of squares, a skill that is necessary in the discrimination of letter characteristics.
When the child understands that each block ❒ corresponds to a printed square □ have him match the spatial configuration of the squares, placing the blocks beneath the model.



For the child who is having difficulty in performing the activity, provide additional cues by coloring each square and having the child place matched color blocks on the squares.
Later you might have the child do the same activity with natural wood cubes. By removing the color cues, the activity becomes more difficult.
At the most advanced level, you might place letters in the squares, e.g., the letters k,l,t, fit into ⊟ , the letters a, c, o fit into □ and the letters y,j,p fit into ⊟ .

Specific Objective 2: To duplicate the spatial organization of printed symbols.

Materials

Rubber stamps of alphabet letters and numerals.

Individual letters printed on cards. $\boxed{l}$ $\boxed{m}$ $\boxed{p}$ $\boxed{W}$

The height of the cards should be the same, but the width should vary depending on the width of the individual letter.

1. Using the alphabet rubber stamp print a phrase, e.g., the boy, my shoe.

   On a piece of paper, directly under that phrase, demonstrate by printing with the rubber stamps, the same phrase.
   Draw the child's attention to the sequence of letters, the space, and then the next sequence of symbols.
   Have the child duplicate the phrase.
   If he puts all the letters together or separates them incorrectly, show him the spatial organization of the model and repeat the task.

2. Using the rubber stamps of numbers, follow the procedure described in #2 above making algorisms, e.g., $\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$ $\begin{array}{r} 10 \\ +1 \\ \hline 11 \end{array}$ 9-6=3 12-2=10

3. Make a phrase or sentence, using the cards which have letters printed on them. Follow the procedure described in activity #2 above, to duplicate the spatial organization of a phrase or sentence using individual letter cards.

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CREED 5 CURRICULUM

CONCEPTUALIZATION

Objectives and Activities

Carol Milligan, M.A.

CONCEPTUALIZATION

Carol Milligan, M.A.

Introduction

A child learns to represent internally what he experiences in the external world. He learns that symbols can represent people, actions, objects, events. Later on, of course, symbols come to represent ideas, abstractions and logical notions; but initially a young child's understanding is closely tied to what he experiences directly in the physical world. In order to interpret, represent, and manipulate sensory experiences, a child must be in command of a system of symbols. Language, of course, is the symbol system with which we are most familiar and the one which is the focus of most formal instruction. There are other ways of representing information, however, which are extremely important. For example, there is an increasing body of knowledge in the experimental and theoretical literature of psychology about the crucial role of the manipulation of internal visual images in certain kinds of problem-solving. We believe that a child's active involvement in activities which involve representation and symbolizing in modes other than language will contribute significantly to his learning, particularly in the group of children we are concerned with.

To this end, we have paid particular attention to instructional objectives which suggest that children be involved in tasks that lead them to experiment with and create symbols in a number of modes. We have suggested activities, for example, which should lead a child to put together constructions, to plan actions, to figure out relationships, etc.

If a concept, or any symbol which refers to a concept (e.g., language or gesture), is to be learned or internalized, several considerations need to be kept in mind. First, the concept which is being taught must be communicated unambiguously to the child. The teacher can do this in a number of ways -- for example, by pointing, reducing distracting cues, or by doing the required task while the child watches.

Second, the same concept should be demonstrated or taught in a number of contexts, using different kinds of materials, and it should be repeated on several occasions. The teacher should provide a breadth of experiences to meet each specific objective. Learning is more efficient if repetition is spread over a number of occasions that if all repetitions occur at the same time.

Third, if material to be taught involves more than one idea, you must be sure the child understands the notions which are fundamental to the task before he is given the more complicated task. For example, if you want to teach that "Three is more than two," you must first be sure the child understands language and the concept of "more," and that he has a concept of number (two = 00; three = 000).

Fourth, don't hesitate to involve your children in interesting activities, even when you believe the concepts involved are too advanced. For example, young children will be interested in, and learn something from, the experience of planting and growing seeds even though abstract concepts of plant metamorphosis are too difficult for them. A caution is perhaps necessary here; if she presents advanced tasks to him, the teacher must permit the child to take from it what he can at the time. She must not attempt to belabor objectives beyond him.

The objectives and specific activities to meet these objectives described below are designed to contribute to the development of many different conceptual skills. There will be overlap in some cases with the objectives and activities from the Visual Analysis section of the curriculum. This follows, of course, from the fact that it is difficult to decide what skills are "perceptual" and which are "conceptual."

There are objectives which will be attained by every child, even those as young as three years; others may be beyond the abilities of even your six-and seven-year-olds, especially those with learning disabilities. The activities under Specific Objectives for General Objectives I and II tend to be the easiest; they are probably most appropriate for three-, four-, and perhaps five-year-olds. These G.O.'s cover basic skills, however, and should not be omitted even for older children. General Objectives III through VI contain more difficult Specific Objectives, but there are activities appropriate to the younger children here, also. In most cases it is difficult to determine precisely at what age a child should meet an objective, but within each G.O. we have tried to order the S.O.'s sequentially. It will no doubt happen that a child will find an S.O. which comes late in a sequence easier than one which comes early. Children do progress somewhat unevenly, so that success on a later activity does not necessarily mean that a child has mastered what we might see as earlier skills.

Working in the area of intellectual development presents a challenge for the teacher as well as for the child, since she must constantly evaluate what the child has mastered, what he is ready to learn, and how to choose an activity which will be both an education for him and in harmony with what he is interested in. The objectives outlined below have been structured to provide a tool for the teacher in her process of articulating and making systematic the educational goals for the children for whom she is responsible.

General Objective I: To develop the ability to see similarities between objects and to classify on the basis of such similarities. A basic cognitive skill is the ability to see similarities between objects, events, situations, and so on. The ability adults have to think abstractly about similarities has its origins in early childhood. We need to provide situations in which a child's attention is drawn to different ways in which things can be seen as similar and to different reasons that objects can be seen to "go together."

Things can be said to be similar because they are the same in some abstract way; for example, same size, same color, same shape, same thickness, etc. Things also go together because of some similarity in function; they may be used together or be used in the same situation. We can also judge objects as similar because of class membership (e.g., food, clothing, animals, etc.). Asking children to put together items which go together in as many different ways as possible may lead to increased flexibility in how they think about and order objects and situations in their everyday activities.

Specific Objective 1: To put together items that go together because of a shared attribute or attributes, e.g., color, size, shape--

a. to sort a collection of objects acoording to one attribute with: 1) no distracting attributes; 2) one distracting attribute; 3) two distracting attributes;

b. to sort pictures of objects according to one attribute with: 1) no distracting attributes; 2) one distracting attribute; 3) two distracting attributes;

c. to sort objects by one attribute, e.g., color, and then to change the basis of the sort--to shape, for example--and sort again;

d. to sort pictures of objects by one attribute and sort again by another;

e. to sort objects by two attributes simultaneously, e.g., color and size with: 1) no distractors and 2) one distractor;

f. to sort pictures by two attributes with: 1) no distractors and 2) one distractor;

g. to sort objects by three attributes simultaneously;

h. to sort pictures by three attributes simultaneously;

i. to solve matrix problems involving sorting by two attributes.

Materials

In general, the materials required for the suggested activities in this section are *collections of objects* which vary in one, two, three, or even four attributes (e.g., size, shape, color, and thickness), *and collections of pictures of flat shapes*, which vary in one, two, or three attributes. Sets of plastic or wooden shapes which vary in size, color, shape, and thickness are available commercially. Teachers can find appropriate objects and equipment they already have in the classroom, e.g., colored blocks. Some additional possibilities are collections of common objects, such as marbles, sea shells, buttons, toy cars, shapes cut from gummed paper, or cloth, etc. Pictures of ordinary physical objects in which variation in shape, color, etc. are easily observable would also be useful

For Activity #9, matrix games or puzzles which involve classifying objects or shapes by two attributes simultaneously can be made, using colored pictures of objects or shapes cut from paper or cardboard and pasted on large squares of paper or cardboard. The choices may be slipped in an envelope pasted on the back of the cardboard. A simple problem consists of two rows of pictured objects or shapes which intersect at a right angle. The space at the corner is left blank, and the child must choose the shape which belongs in the empty space from a set of alternatives. An example of such a problem is:

?	yellow butterfly	yellow dog	yellow train
blue flower			
green flower			
red flower			

The correct choice in this case, of course, is a yellow flower.

More complicated problems can be made by arranging colored shapes in a large matrix, with several missing items.

red square	red triangle	red circle	red diamond
blue square	?	blue circle	blue diamond
green square	green triangle	?	?
yellow square	yellow triangle	?	yellow diamond

Many materials which describe activities involving sorting by physical attributes are available commercially. Suggested materials are listed in Appendix A.

Activities

S.O. 1a: To sort a collection of objects according to one attribute with: 1) no distracting attributes; 2) one distracting attribute; 3) two distracting attributes.

1. For a sorting activity in which the child sorts a collection according to one attribute, with no distracting attributes, choose an assortment of objects which varies only along one dimension.

   For example, choose a set of colored blocks which are just the same except for color and ask the child to put those which are the same color together.

   You might choose a set which are all the same except different sizes and ask the child to sort the blocks into different piles according to size.

   For a sorting activity with one distracting attribute, choose a set of objects which vary along two dimensions, for example, color and shape (but not size). Then ask the child to put same-colored pieces together (ignoring shape) or to put same-shape pieces together (ignoring color).

   To sort by one attribute with two distracting attributes, add objects to the above set which vary on a third dimension. You might have objects which vary in color, size, and shape; or color, shape and thickness, for example.

   Ask the child to sort same-colored pieces together (ignoring the other two dimensions). Or he might be asked to put together pieces which are the same thickness (ignoring color and shape).

S.O. 1b: To sort pictures of objects according to one attribute with: 1) no distracting attributes; 2) one distracting attribute; 3) two distracting attributes.

2. Follow the same procedure as in Activity #1 above, but use two-dimensional representations of objects--pictures, drawings, or flat shapes.

S.O. 1c: To sort objects by one attribute (color), and then to change the basis of the sort (to shape), and sort again on the basis of this attribute.

3. Choose objects which vary along at least two dimensions as described in Activity #1 above. Ask the child to sort according to one attribute -- for example, same size -- then put the objects together again and ask the child to sort them again according to another attribute -- for example, same color.

S.O. 1d: To sort pictures of objects by one attribute and sort again by another.

4. Use same procedure as Activity #3 above, but use two-dimensional representations of objects (pictures or flat shapes).

S.O. 1e: To sort objects by two attributes simultaneously; e.g. color and size with: 1) no distractors; and 2) one distractor.

5. To sort objects by two attributes with no distractors, choose an assortment of objects which vary in only two dimensions, as described in Activity #1 above.

   Ask the child to sort according to two attributes. For example, if items vary in color and shape, then all red cubes go in one pile, all red spheres in another, blue cubes in a third, blue spheres in a fourth, etc.

S.O. 1f: To sort pictures by two attributes with: 1) no distractors; 2) one distractor.

6. Follow the procedure described in Activity #5 above but use two-dimensional forms or representations of objects.

S.O. 1g: To sort objects by three attributes simultaneously.

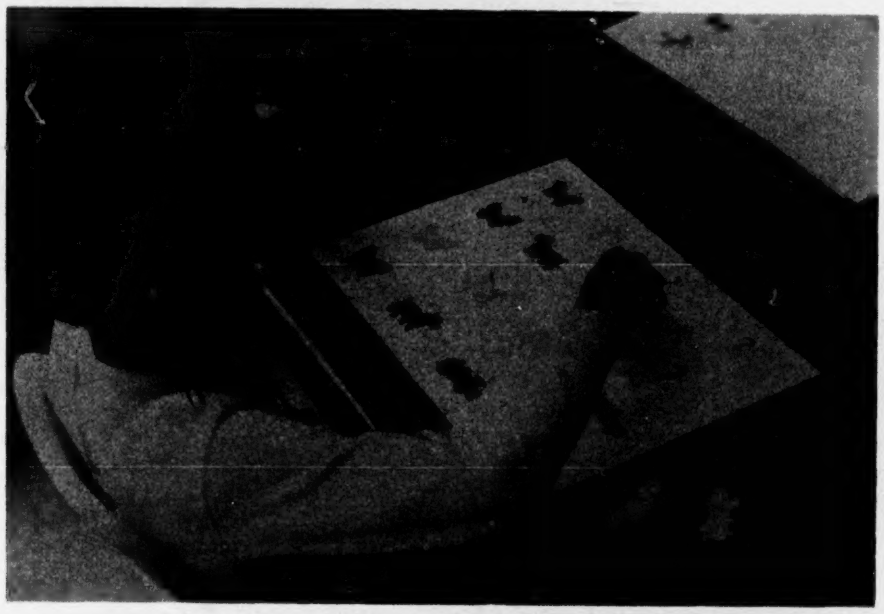
7. Choose a set of objects which vary along three dimensions. Ask the child to sort by three attributes. For example, if objects vary as to color, shape, and size, all small red spheres go in one pile, all large red spheres in another, small blue spheres in a third, large blue spheres, in a fourth, small red cubes in a fifth, etc.

S.O. 1h: To sort pictures by three attributes simultaneously.

8. Follow the procedure described in Activity #7 above, but use two-dimensional representations of objects--for example, pictures or cardboard shapes.

S.O. 1i: To solve matrix problems involving sorting by two attributes.

9. Present matrix problems as described under materials. Begin with easy problems and gradually progress to more difficult.



Memory Task

Combination:

Long Presentation	Random Order
Visual Modality	Recognition
3 Units	Gross Motor

Materials

Several sets of objects that vary along some dimension or according to some perceptible attribute.

Activity

Select 3 colors (i.e., blue, green, yellow). For each color select 4 objects- so that you have collected 4 blue objects, 4 green objects, 4 yellow objects, totaling 12 objects in all.
Have the child sort the objects by color so that he has made 3 distinct groups (i.e., 1 green group, 1 blue group and 1 yellow group).
Take the objects and hide them in 3 different areas of the classroom.
Take the child with you and let him select the hiding places where you conceal the objects.
Be sure the objects are hidden from view.
After the child has seen where the objects have been hidden, return to the child's desk.
Hold up one of the colors (either blue, green or yellow).
Have the child retrieve the blue forms from their hiding places.
Hold up another color,and etc.

To Make Task Easier, change the combination in the following ways:

Length of Presentation. Immediately after you have hidden the forms, hold up all three colors. Have the child retrieve all the forms from their hiding places.

To Make the Task More Difficult, change the combination in the following ways:

Number of Units. Increase the number of colors.

Specific Order. Display sequence of colors in which he must retrieve the forms (e.g., yellow, blue, green).

Length of Presentation. Ask the child to retrieve the objects over several hours or days.

Memory Task

Combination:

Long Presentation	Random Order
Visual Modality	Recognition
6 Units	Sensory-Motor

Materials

Blocks
Beads - round
cylindrical
square

Activity

This type of activity is included to give an example of how memory might be increased through grouping the elements to be remembered.

Select a number of three-dimensional forms, e.g., one red cube; two 1" cylindrical beads, 1 red and 1 blue; three square beads, 2 blue and 1 red.
Place these objects on the table.
Have the child view them for a period longer than 5 seconds.
Cover the objects to hide them from view.
Give the child eight three-dimensional forms including the same six that correspond to your model.
Have the child select the same objects that he has just seen.
Show the child your model and have him check his response.

To Make This Task Easier, form classification groups for the child: e.g., 1 red cube, 1 red cylindrical, 1 red square bead, 2 blue square beads, 1 blue cylindrical bead.
Using the same six 3-dimensional objects you can create 2 groups based on color.
Show the child these groups and explain the rationale behind your groupings.
At other times, use other groupings for objects such as shape, size, etc.

Specific Objective 2: To put together objects on the basis of functional association--

a. to be able to put together sets of two objects which go together because of some functional association; e.g., fireman with fireman's hat, pencil with paper, etc.;

b. to be able to put together sets of two pictures of objects which go together because of a functional association;

c. to sort a collection of objects by function;

d. to sort a collection of pictures of objects by function.

Materials

The materials required for the activities below consist of: 1) real objects or pictures of objects which can be sorted into pairs on the basis of use or functional association, for example, pencil and paper, milk and straw or paper cup, sock and shoe, table and chair, etc.; 2) collections of objects or pictures of objects which may be grouped together on the basis of common use or function. For example, the functionally paired set of paper and pencil can be extended into a collection by adding an eraser, crayon, felt-tip marker, pen, and other objects associated with writing and drawing.

Activities

S.O. 2a: To be able to put together sets of two objects which go together because of some functional association, e.g., fireman with fireman's hat, pencil with paper, etc.

1. Make a collection of objects which can be sorted as to functional associations.

   Choose one and ask the child to choose one from the remaining set that goes with it. If the child is able to respond, ask him to verbalize why he puts the two together.

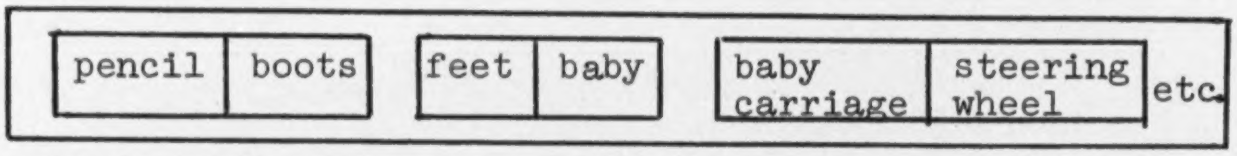
   Choose another object and repeat the above procedure. Start with three or four pairs of objects and gradually increase the number used.

S.O. 2b: To be able to put together sets of two pictures of objects which go together because of a functional association.

2. Follow the procedure described in Activity #1 above, but use pictures of objects. Construct a domino-like game by pasting or drawing pictures of objects that go together on cardboard rectangles (size should be determined according to preferences of children in the class) which are divided into two equal parts.

   Choose pictures which are so commonly associated that children can easily recognize their relatedness. For example, paste a picture of a toothbrush on one end of a card, and a picture of a mouth with teeth on the end of another card, so that the two things which go together can be placed next to each other. Make 28 pieces, as in a regular dominoes game. Children can play with this game individually or in pairs, following the rules for playing dominoes.

   You might use pairs like pencil and paper, steering wheel and car, boots and feet, or baby and baby carriage. The beginning of the game might then look like this:



   Begin with only a few pairs and increase the number as the child succeeds.

S.O. 2c: To sort a collection of objects by function.

3. Take a collection of objects which can be sorted into pairs by function, make one pair and ask the child to sort the entire collection into the appropriate pairs. For example, pen and pencil, shoe and boot.

   Start with three or four pairs and gradually increase the number.

   After the child is able to sort into pairs, increase the number of objects in each set and ask him to sort into larger piles or groups.

S.O. 2d: To sort a collection of pictures of objects by function.

4. Follow the procedure described in Activity #3 above, using pictures of objects.

Specific Objective 3: To put together items on the basis of class membership--

a. to put together sets of two objects according to class membership;

b. to put together sets of two pictures of objects according to class membership;

c. to sort a collection of objects by class membership; e.g., animals, people, furniture, clothing, tools, etc., with several items in each class;

d. to sort a collection of pictures of objects by class membership, with several items in each class.

Materials

For the sorting activities described below, put together a set of common objects which can be sorted on the basis of class membership. You might put together, for example, a set including toys, animals, people, furniture, tools, fruit, etc.

For the activities in which the children sort pictures of objects, choose pictures of objects which can be sorted according to class membership.

Activities

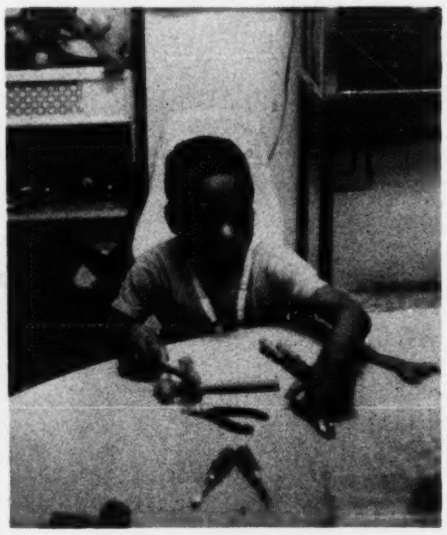
S.O. 3a: To put together sets of two objects according to class membership.

1. Make a collection of objects consisting of sets of two pairs from the same class--for example, two fruits, two tools, two animals, etc.

   Select a member of each pair and ask the child to choose the one from the remaining array that goes with it.

   You may want to put one from each pair in front of the child and let him put each of the remaining objects where it should go.

2. Using a collection of objects similar to that described in Activity #1 above, ask the child to sort the entire collection into the sets of two that go together.



S.O. 3b: To put together sets of two pictures of objects according to class membership.

3. Follow the same procedure as in Activity #1 and Activity #2 above, but use pictures of objects.

S.O. 3c: To sort a collection of objects by class membership--e.g., animals, people, furniture, clothing, tools, etc., with several items in each class.

4. Use a collection of objects similar to that described in Activity #1 above, but with several objects in each class--six fruits, six tools, etc. Ask the child to sort the collection into piles of objects which go together.

5. Arrange the classroom so that materials that are alike are stored together within reach of the children. For example, store paper in one place, toys in another, paints in another, books in another, etc.

   After supplies are used, ask the child to return them to their storage places. At first you may need to help him, but increase very gradually the amount of the task you ask him to do on his own.

S.O. 3d: To sort a collection of pictures of objects by class membership, with several items in each class.

6. Follow the instructions for Activity #4 above, but use pictures of real objects.

Conceptualization

G.O. I S.O. 3

Memory Task

Combination:

Short Presentation
Visual Modality
Concrete
10 Units
Random Order
Recognition
Gross Motor

Materials

Any 10 objects that are not usually found in the classroom, e.g., soda bottle, silverware, adult's shoe, cotton wads, can opener, key, etc.

Activity

Show all 10 objects to the class.
Talk about the objects, their uses, characteristics, etc.
Permit the children to handle the objects.
Tell the children that you are going to hide the objects around the room.
Hide the objects.
Allow the children to watch where you are placing them.
Tell them that at a special time later in the day (or later in the week) you will ask them to find the objects.
Because this activity can be repeated by varying the objects and their locations, a graph could be made plotting how many objects each child found.
To use this activity within the framework of your classroom, it is suggested that you assign each child a special time that he will be allowed to search the room for hidden objects.

To Make Task Easier, change the combinations in the following ways:

Number of Units. Vary the number of objects to be found. When you present the 10 objects to the child and talk about their characteristics, form groups, e.g., put all red things in a group or put all silverware in a group. Hide all the members of a group together.

Length of Intervening Period. Immediately after you have hidden the objects, allow the child to search for them.

To Make Task Easier, change the combination in the following ways:

Sensory Modality. Instead of having the child view material and recognize it by feeling for it, use the same 4 items. Have the youngster view them and feel them, talk about them and their characteristic traits, i.e., both are animals, both are things to eat. Then add the 2 other objects to your table and have him select, while still displayed, the 4 original objects you had discussed.

Number of Units. Use fewer objects.

To Make Task More Difficult, change the combination in the following ways:

Length of Presentation. Reduce the amount of time the child has to view material.

Number of Units. Increase the number of objects used within each group (i.e., use 3 animals and 3 fruits) or increase the groups -- i.e., use tiger and elephant (animals), banana and orange (fruit) or bus and car (vehicles).

Level of Representation. Have the child view pictures that correspond to the three-dimensional objects. After viewing the pictures (tiger, elephant, orange, banana), have him feel the objects in the paper bag or box and select the objects that correspond to the pictures he has seen.

Specific Order. Have the child reproduce the position of the three-dimensional forms in the order in which they were presented.

Conceptualization

G.O.I S.O.3

Memory Task

Combination:

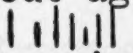
Long Presentation	Random Order
Cross Modality	Recognition
2 Units	Sensory Motor
Concrete	

Materials

Put together a collection of 3-dimensional objects which can be sorted on the basis of class membership. Put together a set, including toy animals, people, furniture, tools, etc.
Paper bag.

Activity

Select 2 objects of the same class, e.g., elephant-tiger (animals), banana-orange (fruit).
Place the objects on a table, e.g., banana, elephant, tiger, orange.
Have the child group the fruit and the animals together and view them for a period longer than 5 seconds.
Place the objects into a paper bag with other three-dimensional objects, e.g., the bag might contain a banana, orange, elephant, tiger, truck and block.
Have the child reach into a paper bag, without looking, and select the objects he has just seen.

General Objective II: To develop understanding of principles of serial ordering. One way a child learns to order his environment is by learning that items can be similar or can vary along certain dimensions. For example, people can be ordered along the dimension of "height"-- two people can be the same height, or one can be taller than the other. Blocks can vary as to "size" -- two blocks can be the same size, or one can be bigger than the other. We have found that very young normal children can compare two objects according to such obvious perceptible differences as height, size, cleanliness, weight, and so on. Gradually they learn that more than two items can be ordered along such dimensions. In an early attempt to order a large set of items as to length, for example, a child is likely to order a sub-set of two or three items, then choose another sub-set to order, and so on. At about age four, then, his array might look like this:  . Gradually, as he accumulates the kinds of experiences described above over a period of years, a normal child learns to keep in mind the concept of a dimension. That is, at about age seven, he is no longer tied directly to what he sees (his perceptions), but can direct his ordering activities by thinking about what the finished sequence should be.

Specific Objective 1: To make comparisons of two objects according to a perceptible attribute; e.g., to choose the bigger, smaller, taller, shorter, fatter, thinner, cleaner, dirtier, harder, softer, etc., of two objects--

a. to compare two objects according to a perceptible attribute;

b. to compare two two-dimensional representations of objects (drawings or photographs) according to a perceptible attribute.

Materials

The classroom contains innumerable opportunities for comparing objects along various dimensions -- pencils are fat and thin, short and long; dolls are big and small; balls may be hard and soft; cotton, fur and sandpaper vary in texture; chairs and tables may vary in height. It may be helpful for the teacher to survey the classroom for available possibilities for comparing objects along a variety of dimensions. Pictures of objects which vary along some dimension will be needed for comparison of two-dimensional representations of real objects.

Activities

S.O. 1a: To compare two objects according to a perceptible attribute.

1. Show the child two objects which vary in some way--for example, two blocks which are different sizes, one large and one small. Put the blocks on the table in front of the child and ask him to choose the "big" one. If he chooses correctly, replace the block and ask him to choose the "small" one.

   Then show him two other items which vary in the same way, and ask him again to choose the "big" one and the "small" one. When you see that he has a firm grasp on this concept, move on to another one--for example "fat" and "thin," using blocks which vary in width, or perhaps two dolls, one fat, and one thin.

S.O. 1b: To compare two two-dimensional representations of objects (drawings or photographs) according to a perceptible attribute.

2. Follow the procedure described in Activity #1 above but use drawings or photographs of real objects.

Specific Objective 2: To order a collection of objects according to a perceptible dimension or attribute; e.g., size, cleanliness, height, width, hardness, shades of a color, etc.--

a. to order a small collection of objects (three or four) along a dimension;

b. to order a small set of two-dimensional representations (drawings or photographs) of objects (three or four) along a dimension;

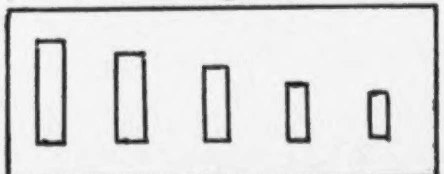
c. to order a collection of several objects (five to ten) along a dimension;

d. to order an array of several pictures (five to ten) along a dimension;

e. to create the items for an ordered array.

Materials

For this objective, you will need several sets of objects and pictures of objects. Each set should vary along some dimension, or according to some perceptible attribute--for example, size, cleanliness, height, width, shades of a color (from light to dark), etc. Many materials are available commercially which can be ordered in some way, or which can be found in the classroom or made from suitable materials. You might use blocks, dowels, or corks of varying sizes and heights, for example:



You can draw objects which can be ordered by size or height. You can find or paint squares of paper which vary the shades of a color from light to dark.

Activities

S.O. 2a: To order a small collection of objects (three or four) along a dimension.

1. Make a row of three or four objects which can be ordered along a dimension, for example, blocks which can be ordered from smallest to largest. Give the child duplicate objects and ask the child to make his look like the teacher's.

2. Start a sequence with two or three objects, give the child two, three, or four additional objects in the series and ask him to finish the series.

3. Give the child a stacking toy that has pieces that vary in size or diameter and allow him to experiment with it on his own.

S.O. 2b: To order a small set of two-dimensional representations (drawings or photographs) of objects (three or four) along a dimension.

4. Follow the same procedure as in Activity #1 and Activity #2 above, but use pictures or drawings of real objects or two-dimensional forms.

S.O. 2c: To order a collection of several objects (five to ten) along a dimension.

5. Follow the same procedure as in Activity #1 and Activity #2 above, but increase the number of objects one at a time, from five to ten.

S.O. 2d: To order an array of several pictures (five to ten) along a dimension.

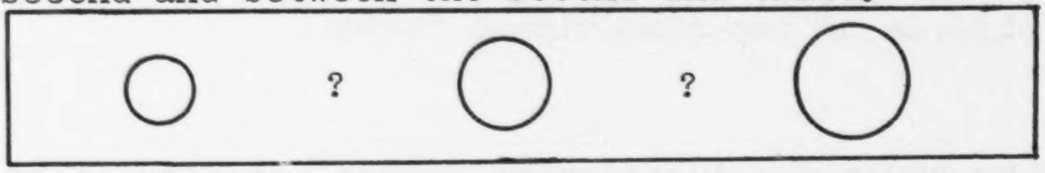
6. Follow the same procedure as in Activity #1 and Activity #2 above, but increase the number of pictures to be ordered from five to ten.

S.O. 2e: To create the items for an ordered array.

7. Make a row of objects which vary in some way and ask the child to make an array like yours. Possibilities for materials are clay balls graduated in size, strips cut from paper which vary in length, or shades of a color painted on paper.

8. Begin an ordered array with materials of the sort suggested in Activity #7 above, and ask the child to continue it.

9. Make an array with "gaps" and ask the child to make objects which will fit the gaps. For example, you might make three clay balls, one small, one medium, and one large. They would be placed on the table in front of the child, with spaces between the first and second and between the second and third.



Then ask the child to make clay balls to fit the empty spaces. He should then make two balls, one intermediate in size between the small and medium one, and one intermediate in size between the medium and large balls.

10. Follow the instructions for the activity described in Activity #9 above, but have the child cut the objects for the array from paper. Other possibilities are circles of varying sizes painted on paper, or shapes cut from clay using cookie cutters of varying sizes.

General Objective III: To develop the ability to interpret and use different ways of representing, coding and symbolizing objects, actions and events. When a child learns language, he learns a particularly complex and useful system which he can use to symbolize for himself and to communicate with others about his experience. Language, however, is only one form of coding, symbolizing, and representing objects and habits from the environment, and only one means of communicating one's ideas to others. The purpose of the activities outlined below is to widen children's experience with different ways of representing objects, events and ideas, and to foster their creativity in finding and using new methods of symbolizing. In addition, experience with the coding process may well enhance the acquisition of language.

Providing instruction in this area will provide a particular challenge to a teacher's ingenuity and creativity in developing new activities for her students. The teacher should be particularly attuned to a child's own explanations with different methods of representation -- verbal, pictorial, three-dimensional (building with blocks, clay, gestural, imitative, etc.) -- so as to be able to sharpen the experience for the child and enhance the meaning it has for him. In other words, a child's play can provide the medium for important learning experiences for him if the teacher recognizes its representational aspects and makes them salient for the child.

Specific Objective 1: To match simple sequences --

a. to match simple sequences of three-dimensional objects (beads, blocks, toys, etc.) with other instances of the same objects;

b. to match simple sequences of three-dimensional objects with objects of a different size or color;

c. to match simple sequences of objects with pictures of the objects;

d. to create a match between a pictured sequence out of real objects;

e. to create a match between a pictured sequence by making a matching sequence from pictures of objects;

f. to create a match between sequences of letters which vary in size or form.

Materials

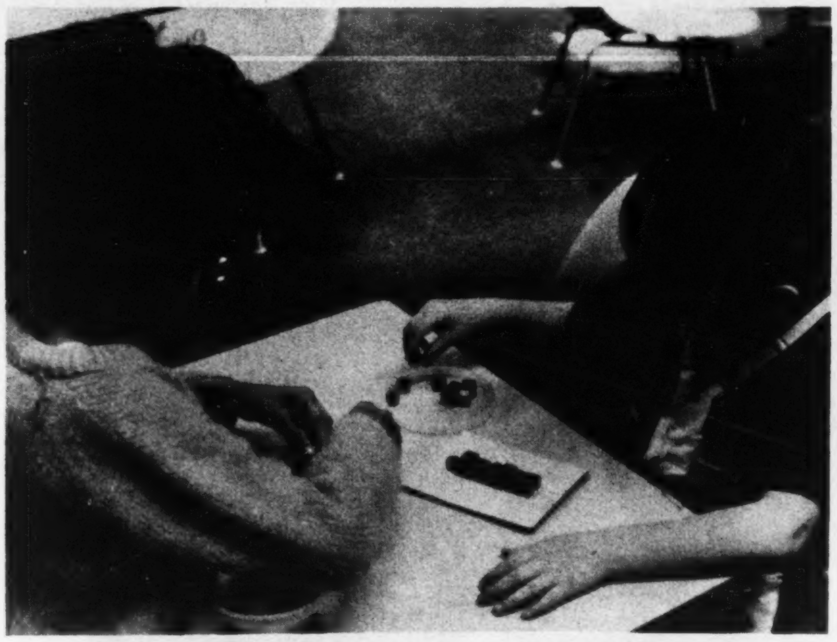
For the activities in this section, you can use any sort of objects -- everyday objects from home or classroom; toys, utensils, etc. In some cases you will need two of each object and in some cases objects which are alike, but which differ in some way -- for example, beads of the same shape and color, but different sizes. For the activities which require two-dimensional representations of real objects (S.O. 1c and S.O. 1e) use drawings, pictures or photographs of the objects. Many sets of pictures of common objects (foods, animals, etc.) are available commercially. You may want to cut pictures from magazines or have the children draw pictures or take their own photographs. Sets of pictures of sequences of colored blocks and matching blocks are also available commercially and can be used for the activities.

For activities whose purpose is to show equivalence between letters of different sizes and type faces (S.O. 1f) you will need a rubber-stamp printing set. You can print or cut from magazines, letters and numerals of different sizes and type faces. Small letters and number cards which serve this purpose are also available commercially.

For Activity #7 use blocks with different letters printed on the sides. There is available a toy which you can use called "Twirl-a-Word." This is a set of three blocks with letters printed on each side, which can be rotated to form a number of different words.

Activities

1. (For S.O. 1a)
   Choose a collection of objects, so that you have two of each kind.
   Arrange one of each kind into a sequence of three objects.
   Give the child a set of five or six objects, including duplicates of the three you have arranged.
   Ask the child to make a row that looks like yours.
   Continue this activity, gradually increasing the length of the sequence you ask the child to match.



2. (For S.O. 1b)
   Choose a collection of objects. Select a second set identical to the first set, but varying in one way. For example, you might use one set of small blue beads and a second set of small red beads; or one set of small blue beads and a second set of large blue beads. Follow the instructions in Activity #1 above except give the child objects of a different size or color from the model he is to match.

3. (For S.O. 1c)
   Choose a set of three-dimensional objects and matching pictures.
   Follow the instructions in Activity #1 above. Make the model sequence with the real objects and ask the child to put the pictures of the objects in the same sequence.

6. (For S.O. 1f)
Make a sequence of letters using letters of the same type-face.
Give the child letters of another type-face and ask him to match the model sequence.
Increase the length of the sequence gradually from two to six.

7. Make a sequence of three letters, either hand-written on paper or chalkboard, or with printed letters.
Ask the child to make a matching sequence from blocks with letters printed on the sides.

8. Print a sequence of letters or numbers using letter or numeral rubber stamps.
Ask the child to make the same sequence, using the same stamps.
Increase the length of the sequence from two to six.

C-23

Conceptualization

G.O.III S.O.1

Memory Task

Combination

Long Presentation
Visual - Auditory - Kinesthetic Modalities
3 Units
Abstract
Random Order
Reproduction
Sensory-Motor

Materials

Three-dimensional letters -- uppercase and lowercase

Activity

Select 3 three-dimensional letters, e.g., C, K, V.
Place them in a row on a table or on the floor.
Name each letter. Allow the child to feel and view each letter for a period longer than 5 seconds.
Cover the letters.
Have the youngster select the corresponding letters in lower case, c, k, v, in any order.
First use letters that are similar in both lower and upper case: c, o, s, u, v, w, x, z, m, k, p, j, y.
When the child is able to match those letters, use letters that are dissimilar in upper and lower case: n, l, t, i, f, a, d, b, e, g, h, q, r.

To Make the Task Easier, change the combination in the following ways:

Number of Units. Use fewer letters.

Level of Representation. Have the child write the letters in the same case (upper or lower) as the one presented.

To Make the Task More Difficult, change the combination in the following ways:

Length of Presentation. Present material for a shorter period of time.

Specific Order. Have the child select or write the corresponding lower case letters in the order in which he saw them displayed.

Memory Task

Combination:

Long Presentation	Random Order
Visual Modality	Recognition
3 Units	Sensory-Motor

Materials

Everyday objects from house or classroom in duplicate sets; e.g., toys, utensils. Some activities will require two-dimensional representations of real objects. Use drawings, pictures or photographs of the objects.

Activity

Choose a collection of objects so that you have 2 of each.
Order 1 of each into a sequence of 3 objects.
Have the child view the sequence for a period longer than 5 seconds.
Hide your sequence from view, keeping it intact as a model.
Give the child 5 or 6 objects, including a duplicate of the 3 you have arranged.
Ask the child to select the 3 objects that correspond to your model.
At this stage, he need not duplicate the sequence but simply select those same objects that he has just viewed.
After the child has selected the objects, show him the model so he can check his responses.

To Make Task Easier, change the combination in the following ways:

Sensory Modality. Have the child feel the objects as well as view them (tactile-visual). You might talk about the objects,allowing him to make associations that might aid him when he is asked to recall.

To Make Task More Difficult, change the combination in the following ways:

Length of Presentation. Allow the child to view the objects for a period shorter than 5 seconds.

Number of Units. Increase the number of objects the child must remember.

Level of Representation. Use more abstract material, e.g., the rubber stamp letters, colored shapes (abstract).

Across Levels of Representation. As the child becomes more proficient at this type of task, show the child the three-dimensional objects. Using two-dimensional representation, have him select the pictures that correspond to the objects he has just seen.

Specific Order. Have the child reorder the sequence you have arranged.

Provide the child with the correct objects and ask him to duplicate the sequence of objects hidden from view.

Specific Objective 2: To create representations --

a. to represent an object by tracing around it;

b. to represent an object by drawing it;

c. to represent a sequence of objects by drawing around them or tracing their outlines;

d. to represent a sequence of objects by drawing them;

e. to represent objects with shadows--e.g., silhouettes and shadow play.

Materials

For the activities described for this specific objective, use various objects such as books, blocks, jar lids which have good outlines for tracing. For producing shadows use a bright portable light against a light-colored wall. Further instructions in making shadows can be found in "Lights & Shadows" (see Appendix A).

The "Match and Measure" booklet describes a number of activities which meet Specific Objective 2c; and "Light and Shadows," Specific Objective 2e (see Appendix A).

Activities

1. (For S.O. 2a)
   Give the child paper, pencil, and an object whose outline can be traced.
   Show the child how he can represent the shape of the object by drawing around it.
   Point out the similarities between the tracing and the object. Hands, tools, scissors, etc., are good possibilities.

2. (For S.O. 2a)
   If you keep tools in the classroom, try to arrange storage on a pegboard, so that an outline of the tool in place can be drawn on the pegboard.
   The children can be asked to put the tools away after they are used, matching each tool with its outline.

3. (For S.O. 2b)
Ask the child to draw, freehand, objects of varying shapes, using paper and pencil or crayon.

4. (For S.O. 2c)
Give the child paper, pencil, and objects whose outlines can be traced.
Show the child how he can represent the shape of the object by drawing around it.
Point out the similarities between the tracing and the object. Hands, tools, scissors, etc. are good possibilities.

5. (For S.O. 2c)
Use the activities described in "Match and Measure".

6. (For S.O. 2d)
Follow the procedure described in Activity #4 above, but ask the child to draw rather than trace the sequence of objects when they are placed on the table in front of him.

7. (For S.O. 2e)
Use the activities suggested in "Light and Shadows," that are appropriate for your class.
Expand the Silhouettes activity in the book to include making silhouettes of objects.

Specific Objective 3: To recognize items from representations or from partial representations--

a. to identify an object from seeing only a part of it, e.g., to recognize a bottle when shown only the bottom;

b. to identify an object from seeing a picture of part of it;

c. to identify a picture of an object when shown a part of the three-dimensional object;

d. to identify an object when shown a duplicate in altered perspective, e.g., to recognize a cube from seeing another cube turned on an edge or corner;

e. to identify an object when shown a picture of the object in altered perspective;

f. to identify a picture of an object when shown a three-dimensional object in different perspective from that pictured;

g. to identify a picture of an object when shown a picture of an object in different perspective.

Materials

These activities require a collection of objects (with duplicates of each object) and pictures of the objects in various perspectives-- full-face, bottom, aerial side-view, etc. Bottles, cups, toy cars are kinds of classroom toys which may be photographed easily from different views. In addition to actual photos of the objects, other two-dimensional illustrations, drawings, and silhouettes may be used.

Activities

1. (For S.O. 3a)
   Use a set of objects and duplicates of each.
   Give the child a set of five or six objects to choose from.
   Choose the duplicate of one object of the set you gave the child and show it to him, so that he can see only part of it.
   For example, cover a bottle with a cloth or cardboard so he sees only the bottom, or show him only the eraser on a pencil.
   Ask him to choose the duplicate from the set he has.
   If he can, ask him to name the object.

2. (For S.O. 3b)
   Use a set of objects and pictures which show parts of the objects. (Common objects and magazine pictures of the objects can be used.)
   Follow the procedure described in Activity #1 above, but show the child a picture of part of an object.

3. (For S.O. 3c)
   Use a set of objects and pictures which show the objects full-face.
   Cover an object so that the child can see only part of it.
   Give him a set of five or six full-face pictures of objects and ask him to choose the picture of the object you're showing him.
   Ask him to name the object if he can.

4. (For S.O. 3d)
   Choose a set of objects and duplicates of each.
   Show the child an object in an unusual perspective;
   For example, a cube turned on an edge or a corner; or a cube or other object placed above or below eye level.
   Another possibility is to show the child a pencil placed horizontally above eye level. Ask him to choose a uplicate of the object from objects placed directly in front of him.

5. (For S.O. 3e)
   Follow the procedure described in Activity #4 above, but show the child a picture of an object in an unusual perspective.

6. (For S.O. 3f)
   Use objects and full-face pictures of the objects. Show the child an object in a perspective different from the full-face perspective in the picture. Ask the child to choose the picture of the object from a set of full-face pictures.

7. (For S.O. 3g)
   Use pictures of objects in full-face and pictures of the same objects in unusual perspectives. Show the child a picture of an object in unusual perspective and ask him to choose a picture of the object from a set of five or six full-face pictures.

Memory Task

Combination:

Long Presentation
Visual Modality
Tactile Modality
1 Unit

Across Level of Representation
Specific Order
Recognition
Sensory-Motor

Materials

A collection of objects (with duplicates of each object) and pictures of the objects in various perspectives - full face, bottom, aerial, side view, etc. Common objects can easily be photographed from different views. Other two-dimensional illustrations, drawings and silhouettes may also be used.

Activity

Select pictures of the same object in different positions in space. Place the real object so that it corresponds to one of the pictures, e.g., a cup to the left of a saucer.
Show the child the object.
Have him feel it or trace around it.
Cover the object so that it is no longer in view.
Place 2 pictures before the child, one of which corresponds exactly with the way in which you placed the object. Have the child select the appropriate picture.
Have him compare his response with your model.

To Make Task Easier, select one picture that duplicates three-dimensional objects and other pictures that are completely different, e.g., in the task above, a picture of a girl.

To Make Task More Difficult, increase the number of objects.

Memory Task

Combination:

Long Presentation	Random Order
Visual Modality	Recognition
1 Unit	Gross Motor
Concrete	

Materials

A collection of objects (with duplicates of each object) and pictures of the objects in various perspectives - bottles, cups, toy cards, or kinds of classroom toys which may be photographed easily from different views.

Activity

Select an object and its duplicate, e.g., a pencil.
Place one object conspicuously somewhere in the room.
Cover most of the duplicate object, exposing only one part, e.g., the pencil point.
Have the child view the object part for a period longer than 5 seconds.
Remove the object part from view.
Have the child find the other copy in the room.
When he has retrieved the copy have him check his response by comparing it to the partially covered duplicate.
This type of activity may be used with a group of children.

To Make Task Easier: If the child is unable to recognize the object repeat the task by exposing a greater portion of the object. The following is another possible change in combinations:

Sensory Modality. Have the child feel as well as view the area that is exposed.

To Make Task More Difficult, change the combination in the following ways:

Length of Presentation. Allow the child to view the exposed part of the object for a shorter period of time.

Number of Units. (1) Increase the number of objects that are partially exposed. (2) Using the same object, expose a small area.

Level of Representation. Use more abstract objects, e.g., use the classroom overhead projector. Draw part of a circle on the acetate sheet, e.g., C. Have the child complete the correct form at his desk, or draw part of the letter B. Have the child reproduce the whole form at his desk (abstract).

Specific Objective 4: To be able to represent or symbolize through action--

a. to be able to imitate the appropriate action to use with an object when shown an example of the object;

b. to be able to carry out the action that goes with an object when shown a picture of the object;

c. to be able to choose the correct object from a set when the appropriate action is carried out by a teacher or another child;

d. to be able to choose a picture of an object from a set of pictures when the appropriate action is carried out by a teacher or another child.

Materials

For this objective you will need objects which require some action in their use, such as staplers, erasers, brooms, home tools or kitchen utensils. Also needed are clear pictures of the objects, either photographs that you have taken, pictures from magazines, or drawings.

Activities

1. (For S.O. 4a)
   Choose a manipulative object, for example, a broom, bicycle pump, or rolling pin, and ask the child to imitate the movement which goes with the object. It may be necessary to first give the object to the child, let him observe himself manipulating the object. Immediately afterward, the tool can be taken away and the child encouraged to continue the movement. This can be a game played with a teacher and a child, or between two children.

2. (For S.O. 4b)
   After Activity #1 has been mastered, carry out a similar activity, but use pictures of objects, rather than real tools.

3. (For S.O. 4c)
   Choose a set of assorted tools.

Carry out the action that goes with one of the tools. Ask the child to choose the object from the set which goes with the action. This can be played by 2 children.

4. (For S.O. 4d)
Same as Activity #3 above, but have the child choose from pictures of objects.

Memory Task

Begin this task when the child demonstrates that he can represent through action.

Combination:

Long Presentation	Specific Order
Cross Modality	Reproduction
2 Units	Gross Motor
Across Levels of Representation	

Materials

Stapler, eraser, broom, paper fasteners, tools, home and kitchen implements.

Activity

Select 2 objects, e.g., a broom and a hammer.
Present the objects for the child to view, one at a time for a period longer than 5 seconds.
Direct his attention to order of presentation.
Remove the objects from sight.
Have the child represent the appropriate movement that is associated with the objects in the same order as the objects were introduced to him.
Place the objects in view, in the order presented.
Have the child use the objects to check his responses.

To Make Task Easier, change the combination in the following ways:

Methods of Recall. Teacher (or another child) may act out the appropriate action that matches one of the objects, e.g., perform the sweeping behavior for the child. The child is presented with the 2 objects, and must select the one appropriate to the action viewed (recognition).

Ordering of Recall. The child does not have to execute actions in the order in which the objects were presented.

Specific Objective 5: To use symbolically represented plans to structure actions and sequences of actions--

a. to respond correctly to signs, such as stop signs, miniature traffic lights, or to arrows indicating the direction for a turn;

b. to use these signs to direct the action of another child;

c. to be able to find an object or location by following a map with two or three components;

d. to work with the teacher and/or other children in constructing such simple maps.

Materials

For this objective, simple signs, made on posterboard or construction paper, are necessary. For non-reading children, symbols (e.g., an upturned hand for stop) may be used instead of words. Various toys, and blinds (boxes, waste-baskets) under which they may be hidden, are needed. Maps with drawn symbols to indicate the location of hidden objects may be made with paper and pencil or paint.

Activities

1. (For S.O. 5a)
   Have the children make models of traffic signs with cardboard and paint.
   Teach the children that a sign stands for an action by putting up a sign, approaching the sign yourself, and carrying out the appropriate action. For example, walk up to a "Stop" sign and stop.
   The child can observe and follow your action until he is able to carry out the correct action by himself.
   As he masters different signs, they can be placed along a path, so that he comes to them in series.
   He can pretend to be a car or a train. Several children can play a game like this together, one following the other.

2. (For S.O. 5b)
   Let a child use the prepared signs to direct the movement of the teacher or another child along a path in the classroom or out-of-doors.

3. (For S.O. 5c)
   Play a guessing game with a child in which he finds a target object (toy, candy, etc.) by following an instruction which the teacher presents pictorially.
   For example, a child can be directed to look under a cup for a hidden object by showing him a picture or drawing of a cup.
   As a second step, the problem can be made more complex by having the target object hidden under two objects.
   For example, the cup covering the object can be put under a box. The box can then be placed with another set of objects.
   The child's "map" or directions might then consist of a picture of a box alongside a picture of a cup with an arrow pointing from the box to the cup. The box might be numbered "1" and the cup "2" to indicate order.
   The game can be made much more demanding by increasing the number of steps and by making the objects separated in space. For example, the target object might be hidden in a shoe in the classroom closet.
   The child's directions or "map" might consist of a sketch of the closet and a dotted arrow leading to a picture of a shoe.
   This game can be elaborated indefinitely, depending on the children's ability levels.

4. (For S.O. 5d)
   Use a game setting like that described in Activity #3 above.
   Let the children individually work with the teacher on preparing directions for other children.
   Finally, let a child, or two or three children working together, prepare maps for other children.

Specific Objective 6: To be able to understand simple directions which use attributes of an object to represent the object and symbols to represent actions--

a. to be able to follow simple directions which utilize representations for objects and actions;

b. to be able to work with the teacher in making similar diagrams or "recipes" for other children.

Materials

Use any coloring materials which may be combined to form other colors - plastic color paddles, color gels, food coloring, tempera paint, finger paints, etc.

Activities

1. (For S.O. 6a)
   For this activity, use tempera paints, paper and pencil. Make a diagram on paper which shows how certain colors combine to make other colors. For example, blue + yellow = green; yellow + red = orange; blue + red = purple; red + white = pink.
   The blue + yellow = green diagram would consist of a large blue circle of paint on paper, then "+", then a large yellow circle, then "=", and, last, a large green circle.
   The teacher can show the child how to use the diagram by pointing out the match between each symbol on the diagram and the corresponding step in the mixing process. The child can then be shown new diagrams and asked to make the final color on each.

2. (For S.O. 6b)
   After mastery of Activity #1 the child can make new diagrams from his own color-mixing experiments, which show the outcome of different mixtures.
   Further variations are possible. For example, three colors can be mixed together.
   Or, large circles can indicate that "a lot" of a color should be mixed in, or a small circle to indicate "a little".
   Similar activities can be carried out using food coloring in water or plastic color paddles.

General Objective IV: To develop the ability to structure space, and to understand and use spatial concepts.

The ability to recognize and represent form involves a complex and gradual process of the mutual development of perceptual and conceptual skills. Even in infancy, of course, a child can recognize certain forms. Recall, for example, an infant's smile in response to the appearance of a human face.

In the beginning, a child pays attention to such characteristics of spatial configuration as closure (whether a figure is open or closed), proximity ("next to"), and separation. For example, a young child might be able to discriminate A from B, because one is closed and one is open, but not B from C or D because all are closed. Later a child considers such things as straight lines, angles, parallels, and distances. He then can make such discriminations as circles from squares, squares from rectangles, and so on. Many children need special instruction in order to make such discriminations, both at the level of recognition and at the level of reproduction. The following section is designed to provide experience in both.

The ability to discriminate different shapes and spatial configurations naturally precedes the ability to reproduce these very same shapes. Representation involves conceptual operations which may not be necessary for discrimination, in addition to the very important skill of motor control. With children who have coordination difficulties, practice in representing shapes, objects, or letters can perhaps be facilitated by giving the blocks, sticks, curves, etc. to put together to make more complex shapes. You may need to modify the following activities in this way, when appropriate, to meet the needs of individual children.

In the understanding of the characteristics of spatial entities and spatial configurations, both visual, perceptual and logical skills are important. The activities below therefore overlap to a certain extent with activities in the Visual Analysis section of the curriculum.

Specific Objective 1: To understand basic spatial relationships: in-out, on-off, in front of-in back of, on top of-under, etc.

Materials

Use your imagination in choosing objects from the classrooms or from home to illustrate simple spatial concepts. You will, of course, need different sorts of materials to illustrate different concepts.
There are a number of materials available commercially which illustrate spatial concepts pictorially.

Activities

1. To teach the concept of inside, choose a variety of different objects that can be used to illustrate the concept. In each case you should have a container or enclosure and a smaller object which can be placed inside. You might have, for example, a cup with a block in it, a glass with a marble inside, a shoe with a pencil inside, a circle drawn on paper with a penny inside, etc. Point out the similiarity between each array. Give the child another container and smaller object and indicate with gestures or speech that he should put it "inside" also. If the child does that activity incorrectly, demonstrate what the correct placement is and give him two more objects so he can try again.

2. Repeat the above procedure with different kinds of objects in different contexts. Begin with simple concepts, such as "inside," "outside," "behind," "in front of," "by the side of," "on top of," and "under." With older children (7+) try "to the right of" and "to the left of."

3. Have the children act out the concepts they are learning, using their own bodies. For example, they can place their own bodies with respect to large objects, such as desks, chairs, boxes, or another child.
A child can also place a movable object with respect to his own body. For example, he can place a book "beside," "behind," or "in front of" himself.

Conceptualization

G.O.IV S.O.1

Memory Task

Combination:

Short Presentation
Visual Modality
1 Unit

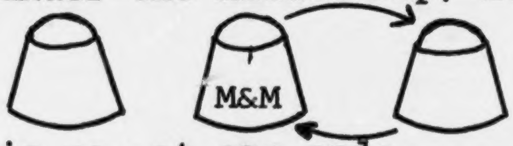
Concrete
Recognition
Sensory Motor

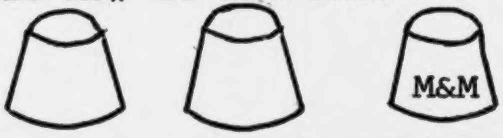
Materials

3 paper cups, any three-dimensional object that can be hidden under a cup, e.g., a nut, a bead, an M&M.

Activity

Place the 3 paper cups upside down on a table.
Put the M&M under one of the cups.
Ask the child to tell you which cup it is under.
Replace the M&M and change the location of the cup.
If the M&M was under the middle cup, move the middle cup so that it is now at one end:

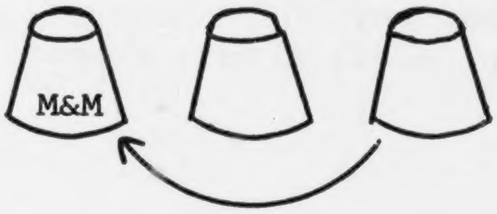




Ask the child to tell you under which cup the M&M can be found now. If he responds correctly, give him the M&M for a reward.

To Make Task More Difficult, change the combination in the following way:

Number of Units. Increase the number of changes made in the position of the **M&M**, e.g., move the cups as described above again, so that the cup with the **M&M** under it is switched to the opposite end, exchanging places with the empty cup already in that position, as follows:



Specific Objective 2: To understand proximity relationships

a. to be able to copy a row of three-dimensional objects;

b. to be able to copy a row of pictures of objects;

c. to be able to copy a row of objects, with objects in the copy squeezed together;

d. to be able to copy a row of objects with objects in the copy spread farther apart than the model;

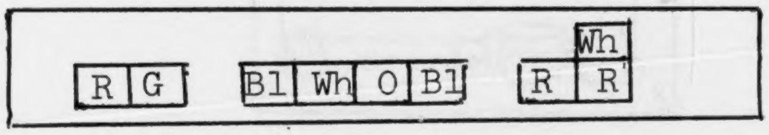
e. to be able to copy a three-dimensional row with the objects reversed;

f. to be able to copy a pictured row with the objects in the copy reversed;

g. to copy a three-dimensional array of objects, e.g., a farm scene.

Materials

Use collections in which you have seven or eight different kinds of objects, with two of each kind. You will also need pictures - drawings, photographs, or illustrations cut from magazines of the different objects.
For Activity #3 above, use colored cubes and diagrams of rows of colored squares which the child is to match with the cubes. One such diagram might look like this:



You can match these. They are also available commercially as "Pre-Writing Designs" (see Appendix A).

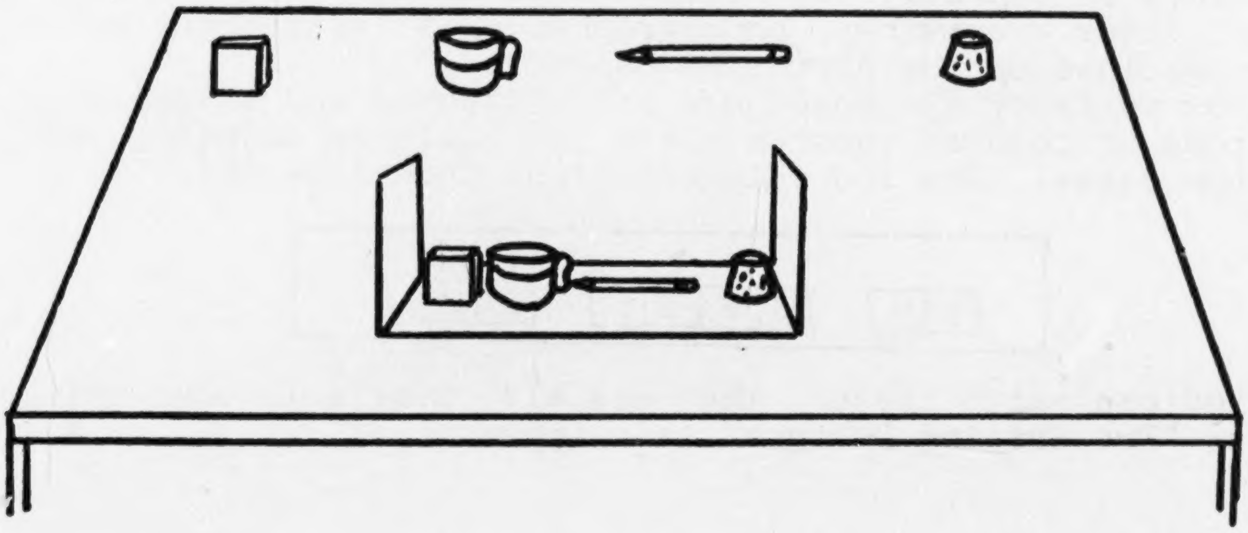
Activities

1. (For S.O. 2a)
Choose a collection of objects so that you have two of each. Choose six or seven different objects and put them in a row.
Give duplicate objects to the child and ask him to make a row that is just like yours.

2. (For S.O. 2b)
Choose objects and pictures of each object.
Put six or seven objects in a row.
Ask the child to make a row of pictures to match the real objects.

3. Have the child arrange one-inch colored cubes to match a diagram made up of colored squares (or "Pre-Writing Designs").

4. (For S.O. 2c)
Follow the procedure described in Activity #1 above, but put the objects in your row six to eight inches apart, and ask the child to put the objects in his reproduction close together.
You can limit the boundaries of the child's row by asking him to make his row inside a frame of some sort. You can use a box with two opposite sides cut away, leaving two sides and a bottom.
Alternatively, you might simply put a piece of paper in front of the child, indicating that the objects in his row must all fit on the paper. To aid the child in his development of this skill, you might put "x's" on the paper to indicate where the objects should be placed.

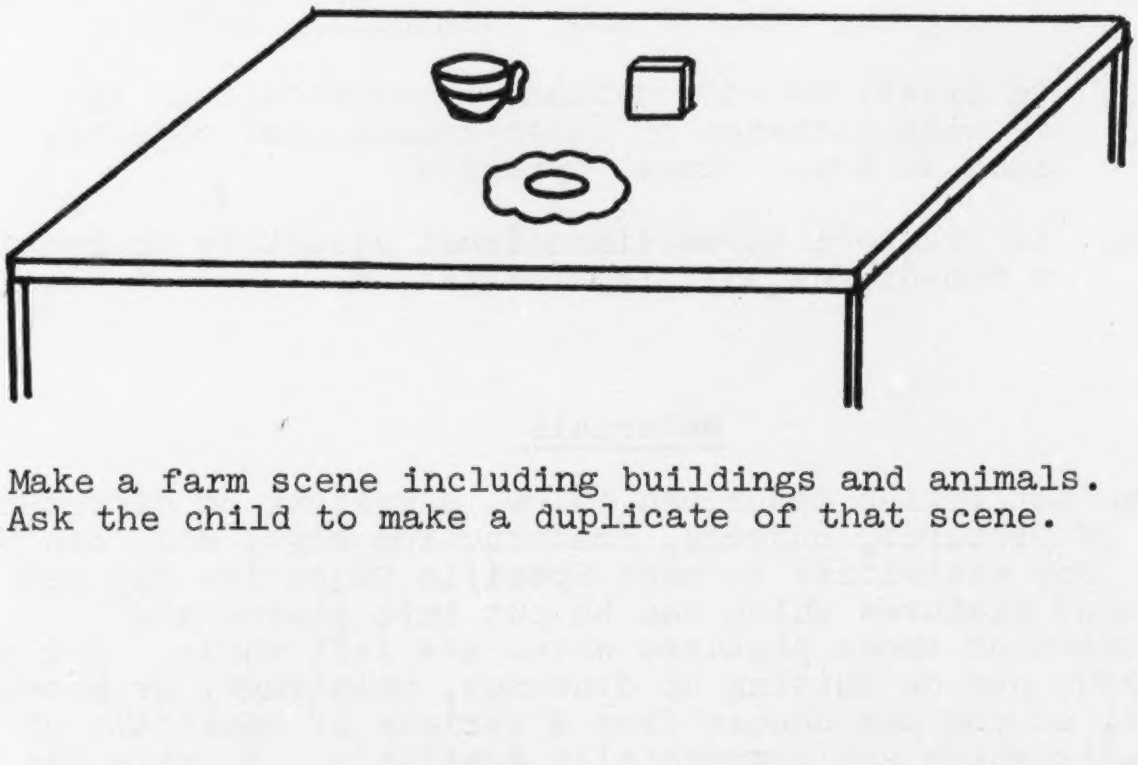


5. (For S.O. 2d)
Follow the procedure described in Activity #4 above, but put the objects in the model close together.
Indicate that he is to put the objects in his reproduction far apart.
You might indicate the extension of the boundaries of his reproduction by placing the end objects yourself or by asking him to put them on a piece of paper on which you have marked "x's" where he should place the objects.

6. (For S.O. 2e)
To support flexibility in use of the concept "next to" or "beside of," ask the child to put the objects in his reproduction backwards, following the procedure in Activity #1 above. For example, 1-2-3-4 becomes 4-3-2-1.
Start with an array of only three objects.
To help the child in his development of this skill, demonstrate by first making a reversed copy of the model row yourself, pointing out the relationship between the copy and the model.
Repeat the activity, gradually increasing the length of the array to six or seven objects.

7. (For S.O. 2f)
Follow the procedure in Activity #6 above, but make the row the child is to copy from pictures of real objects.

8. (For S.O. 2g)
Make an array of objects which are not in a row, for example, three objects in a triangular arrangement.
Give the child duplicate objects and ask him to make his look like yours.
Gradually increase the number of objects in the array you ask him to copy.



9. Make a farm scene including buildings and animals.
Ask the child to make a duplicate of that scene.

Specific Objective 3: To begin to understand spatial transformations and part-whole relations--

a. to put together pieces of a cut-up picture to match teacher's model;

b. to put together pieces of a shape or design to match teacher's model;

c. to put together abstract shapes to match teacher's model, e.g., "Tangrams" (See Appendix A);

d. to make puzzles from pictures by cutting them up and putting them together again;

e. to make puzzles by cutting up abstract designs and geometric forms and putting them together again;

f. to put together three-dimensional constructions to match teacher's model;

g. to take apart and put together again a three-dimensional construction;

h. to create abstract designs by experimentation with different shapes, e.g., "Tangrams";

i. to create a two-dimensional representation of a two-dimensional shape by drawing, e.g., squares, triangles, circles and, eventually, letters;

j. to create two-dimensional representations by drawing pictures of three-dimensional objects, such as toys, cubes, pyramids;

k. to create a three-dimensional structure to model a two-dimensional representation.

Materials

For the activities described below, a variety of different kinds of pictures, objects, construction toys, etc. can be used. For activities to meet Specific Objective 3a, you will need pictures which can be cut into pieces and duplicates of those pictures which are left whole. You can make your own by cutting up drawings, paintings, or photographs, or you can choose from a variety of materials of this sort which are commercially available. To make the pieces more durable and easier to manipulate, you can paste the pictures onto blocks or cardboard backing before cutting them up.
Materials for S.O. 3b are to be similar, but consist of shapes or designs, rather than pictures of recognizable objects.

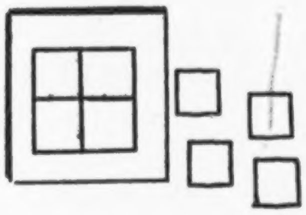
For S.O. 3c and S.O. 3b, the familiar "Tangrams" puzzles, or other geometric shapes which can be put together into designs, can be used. For the activities which involve three-dimensional constructions, use commercially available construction toys, blocks, or any convenient set of classroom objects.

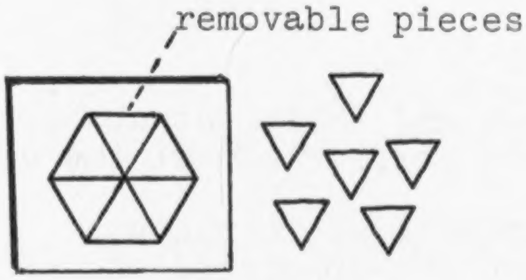
Activities

1. (For S.O. 3a)
   Use pictures and their cut-up duplicates which you have prepared yourself, or one of the commercially available sets.
   Show the child a whole picture.
   Give him the cut-up pieces and ask him to put them together to match the whole picture.
   Start with pictures which are not too complicated and cut them into three or four pieces.
   Present more puzzles, increasing their complexity and the number of pieces.
   If the child is having difficulty in putting the puzzle together, place all but the last piece for him. Have him place the last piece. Continue in this manner allowing him to place more and more pieces until he can put the entire puzzle together. Direct his attention to the context and matching contours of the puzzle pieces.

2. (For S.O. 3b)
Use abstract shapes or designs and duplicates which you have cut up, or use one of the commercially available puzzles of this type.
Show the child a whole design.
Give him the pieces of the same design and ask him to put them together to match the model.
If he does not understand what is required, demonstrate by putting all but the last piece together yourself. Have him place the last piece. Take them apart again and have the child put in the last two pieces. Continue in this manner until the child can put the whole design together.

3. Buy or make designs cut out of cardboard or some other firm material, so that the pieces of the design fit into a template, i.e., an outline frame. You might have squares cut into pieces, circles with wedge-shaped sections, etc.





Give the child the frames and the pieces and have him fit the pieces into the cut-out design.
Once individual puzzles are mastered, give the child the components of two puzzle shapes at one time, so that he has to sort the components from each puzzle in addition to fitting them into their spaces properly.

4. (For S.O. 3c)
   Give the child "Tangram" problems, using purchased "Tangram" pieces, or pieces you make yourself. Begin with easy problems and gradually increase the complexity of the problems you give.
   You can make up the problems yourself or use one of the many available sources of problems.

5. (For S.O. 3d)
   Give the child a magazine picture. Have him cut it up and then put it together again.
   If possible, have a duplicate which is not cut up, so that he can check his finished product to see if it was correct.

6. (For S.O. 3e)
   Give the child a geometric form or abstract design painted or printed on paper. If printed designs are not readily available, ask him to paint or draw one first, or observe while you paint one.
   Have him cut it up and put it together again.
   Try to have a duplicate available so he can check his work.

7. (For S.O.3f)
   Make a simple construction from blocks, e.g., a three-block tower or three-block bridge.
   Ask the child to make one like it.
   Gradually increase the complexity of the model the child is to copy by adding more blocks and more parts.
   Make constructions with a construction toy and ask the child to copy the model, again beginning with simple constructions using a few pieces.

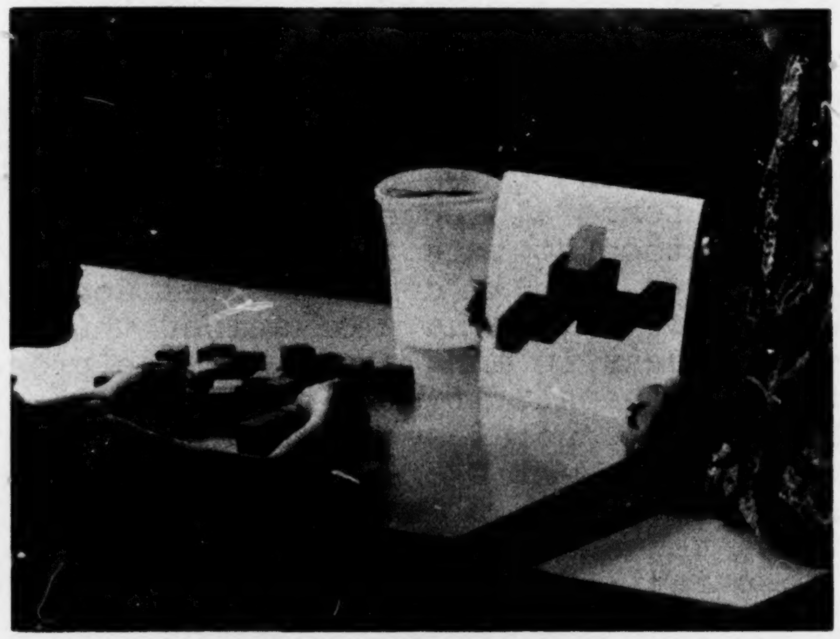
8. (For S.O. 3g)
Give the child a completed three-dimensional construction. Ask him to take it apart and put it together again. If he has trouble remembering what it should look like when finished, give him two identical constructions. Have him take one apart and put it back together to match the other one. Gradually decrease the amount of assistance you give until he can take apart the construction and put it together again on his own.

9. (For S.O. 3h)
Let the child experiment with "Tangrams." Encourage him to carry out different kinds of activities.

10. (For S.O. 3i)
Ask the child to draw different shapes, e.g., squares and triangles, especially those he has been working with in previous activities.

11. (For S.O. 3j)
Ask the child to draw three-dimensional objects and constructions he observes or makes himself.

12. (For S.O. 3k)
Give the child a diagram, drawing, or photograph of a three-dimensional construction made of blocks or other parts.
Give him the blocks or parts necessary to make the construction and have him make it to match the picture.
If he has difficulty, start the construction yourself as he watches and let him finish it.
Gradually decrease the amount of assistance you give.
Increase the complexity of problems you give him.



13. (For S.O. 3k)
Ask the child to plan and structure a construction in advance from blocks or a construction toy and then build it to match the plan.
Encourage him to draw what it will look like before he makes it.

14. (For S.O. 3k)
Show the child a shape cut from paper as a model.
Give him a piece of paper which can be folded to make a shape which is the same as the model. For example, show him a 2x4 rectangle or equilateral triangle. A 4x4 square can be folded in half horizontally to make the displayed rectangle, or in half diagonally to make the displayed triangle.

General Objective V: To acquire understanding of logical sequence across time. The understanding of temporal concepts begins to appear rather late in childhood, even in the course of normal development. Children up to age six or seven often use such words as "tomorrow," "yesterday," "next week," etc., improperly. Most children don't learn to use clocks correctly before second or third grade. The activities in this section are aimed at providing instruction which will help a child organize events along a temporal dimension. The specific objectives and activities cover a fairly wide range of difficulty, but even the easiest may prove to be beyond your younger children (three- or four-year-olds).

Since the process by which children come to grasp notions of temporal sequencing of events is not well understood at this time, it is impossible to describe even a rough developmental sequence of skills. However, we have organized this section with some ideas in mind about how the process might occur. In general, it will be easier for a child to grasp the temporal sequence of events which occur within a short period of time than those which are separated by a long time span. Familiar, repeatedly occurring sequences will be easier for him to order than less familiar or rare events. Short sequences will be easier than longer sequences. The more reasoning required to understand the relations between steps in a sequence, the more difficult it will be for a child to order.

Specific Objective 1: Given a set of items which must be put together in a fixed order, the child must choose which comes next after the teacher chooses the first one or two--

a. to be able to choose which comes next when putting together three-dimensional objects;

b. to be able to choose which comes next when putting together two-dimensional representations of objects or pictures.

Materials

For three-dimensional objects, choose things which must be put together in a determined order - for example, dolls with under and outer doll clothing, nested cups and boxes, "chinese puzzles" (those which are constructed so that their pieces must be put together in a prescribed order) or stacking toys.
For two-dimensional representations of objects, use drawings, pictures, or cut-outs of objects which must be put together in a determined order. Paper dolls, or vinyl dolls with under and outer clothing, are possibilities. Individual transparencies of parts of objects, which when placed on top of one another make a whole object, might be used.

Activities

1. (For S.O. 1a)
   Use a doll with under and outer clothing.
   Begin to dress the doll.
   Put 2 to 5 articles of clothing in front of the child.
   Ask him which comes next.
   Put on the item he picked out and ask him to check his choice.
   If he was wrong, e.g., if he chose a coat to put on before a dress, discuss with him why his choice was incorrect.
   Continue until the doll is fully dressed.

2. Use a three-dimensional construction toy or nested cups or blocks.
   Fit the first two pieces together and ask the child to choose which comes next.
   Assist him in checking whether his choice was correct or not; if not, point out the site of the error and ask him to choose again.
   Ask him to choose the next piece.
   Continue until all the pieces are put together correctly.

3. Use a stacking toy with pieces graduated in size.
   Put together the largest and next largest pieces.
   Place two or three of the next largest pieces in front of the child.
   Ask him to choose which comes next.
   As he succeeds in selecting the correct-sized piece when presented with 2-3 choices, gradually increase the number of choices.

4. (For S.O. 1b)
   Use dolls with vinyl clothing, paper dolls with under and outer clothing, or transparencies of pictures to be put together in a fixed order.
   Follow the procedure described in Activity #1 above.

Specific Objective 2: To be able to put together objects which must be combined in a fixed sequence--

a. to put together three-dimensional objects, e.g., to dress a doll in clothing.

b. to put together two-dimensional representations of objects, e.g., to dress a paper doll with paper clothing.

Materials

For three-dimensional objects, choose things which must be put together in a fixed order - for example, dolls with under and outer clothing, nested cups and boxes, "Chinese puzzles" (those which are constructed so that their pieces must be put together in a prescribed order) or stacking toys.

For two-dimensional representations of objects, use drawings, pictures, or cut-outs of objects which must be put together in a prescribed order. Paper dolls or vinyl dolls with under and outer clothing are possibilities. Transparencies of parts of objects which are to be put together might also be used.

Activities

1. (For S.O. 2a)
   Give the child a toy which must be put together in a fixed order, e.g., a doll and clothing or a stacking toy. Have the child put the item together, drawing his attention to the fact that there is a logical sequence in which the components must be ordered.
   If the child has difficulty in completing the task, place the first few pieces for him, requiring him to select from the final 2 pieces for completion of the task.
   As he succeeds, increase the number of pieces from which he must select.

2. (For S.O. 2b)
   Follow the procedure described in Activity #1, but use two-dimensional representations, e.g., paper dolls with clothing or transparencies.

Specific Objective 3: To be able to construct a spatial arrangement of objects that corresponds to a temporal sequence of actions--

a. to be able to arrange or order objects in the sequence in which they must be put together, e.g., to arrange a doll's clothing on a table in the order in which they must be put on;

b. to be able to arrange or order pictures of objects in the sequence in which they must be put together, e.g., same as 3a above, using paper clothing or pictures of clothing.

Materials

For three-dimensional objects, choose things which must be put together in a fixed order, for example, dolls with under and outer clothing, items of children's clothing, nested cups and boxes, "Chinese puzzles" (those that are constructed so that their pieces must be put together in a prescribed order) or stacking toys.
For two-dimensional representations of objects, use drawings, pictures, or cut-outs of objects which must be put together in a prescribed order. Paper dolls or vinyl dolls with under and outer clothing are possibilities. Transparencies of parts of objects which are to be put together might also be used.

Activities

1. (For S.O. 3a)
   Use a set of materials which must be put together in a fixed order, e.g., a stacking toy or a doll with under and outer clothing.
   If you are using a doll and clothing, put the doll on the table in front of the child.
   Make a row of clothing in the order in which it would be put on the doll, e.g., for the girl, panties, slip, dress, etc.
   Then select each article in order from the row and dress the doll. Emphasize for the child the order of your selection.
   Undress the doll, and start another row with one piece of underwear.
   Ask the child to select the piece of clothing that comes next.
   Continue until the row is completed with all clothing in an appropriate order.
   Then have the child dress the doll, selecting each article in order.
   Continue this activity until the child can correctly construct the entire ordered row himself.

2. To provide additional experience in meeting this objective, use the children's clothing.
   Make a row of clothing in order in which the child would put it on.
   Follow procedures as described in Activity #1 above.

3. (For S.O. 3b)
   Follow the procedure described in Activity #1, but use two-dimensional representations of objects, such as paper dolls with clothing, or transparencies.

Specific Objective 4: To be able to act out the next step in a sequence when the teacher or another child carries out an action. (For example, the teacher or another child acts out getting out of bed in the morning, and the child must act out an appropriate following action, "brushing teeth" or "getting dressed," etc.)

Materials

No particular materials are required for the activities to meet this objective. Use whatever materials are appropriate for the sequences of actions you choose to carry out.

Activities

1. (For S.O. 4a)
   Act out a sequence of 2 steps in an action which the child watches.
   Select those actions with which the child is very familiar, e.g., pretend to put on a coat.
   Then, pretend to zip or button it.
   Again, pretend to put on a coat.
   Ask the child to act out "what comes next."
   If the child has difficulty with the task, it may be necessary to carry out the sequence of actions with the real objects.
   Then immediately carry out the sequence of actions without the objects present.
   After the child understands the nature of the game, continue with other sequences by acting out just one action and asking the child to act out "what comes next."
   Other activities might include: pouring a glass of water, putting toothpaste on a brush and brushing teeth, etc.

Specific Objective 5: To take part in recording an event by portraying the steps of that event--

a. to record an event by working with the teacher to produce a record of that event using Polaroid photographs;

b. to record an event by drawing pictures which represent steps in an event.

Materials

Use a Polaroid camera and/or classroom art supplies to pictorially represent a sequence of steps in an event. See Sensory-Motor Integration, G.O. V for suggestions for photographed sequences of activities. "Changes" and "Starting from Seeds" Teachers Guides give a number of suggestions both for sequences and means of representing them (see Appendix A).

Activities

1. (For S.O. 5a)
   Choose an activity which the class carries out regularly.
   Examples are making juice, getting out paints and painting, or serving snacks.
   As the children carry out the steps in the activity, work with the class in taking Polaroid photographs of the event. As the photographs are completed, have the children lay them out in order.
   After they are finished, paste them on the bulletin board in order, for all the children to look at.
   On subsequent days when the same activity is carried out, direct the children's attention to the sequence of pictures as they perform each step of the sequence.

2. Carry out some of the activities in "Starting from Seeds" or "Changes" and record steps in the sequence through photos or drawings as described in Activity #1 above.
   These will be activities which span several days or weeks, so that the pictures will be separated in time more than those in Activity #1 above.

In this activity, the longer period between stages in the sequences requires that the teacher describe the relationship between one picture and the next, as new ones are added to the sequence.

Note: The concepts underlying the activities in "Starting from Seeds" and "Changes" are very complex, so that the teacher should not expect the pre-school child to fully understand the process of growth.
The primary purpose in presenting it to the young child is to build for him a foundation of information and observarional experiences which will lead to the eventual understanding of naturally occurring phenomena.

3. (For S.O. 5b)
With a child who is good at drawing or who likes to draw, follow the procedure described in Activity #1 above, but have him draw pictures instead of taking photographs.
The primary goal here is not that he should produce "good" pictures, but that they should represent the steps in an activity.

Specific Objective 6: To be able to choose a picture which portrays "which comes next" after the teacher chooses the first one, or to predict what happens next when given a film strip or short sequence of pictures which portray a story or steps in an event.

a. to choose "which comes next" in a sequence, using pictures of action-sequences which are familiar; for example, teacher and children photograph a child getting dressed for gym, first putting on socks, then sneakers, etc.
The child is shown a picture of another child (or himself) putting on socks and has to choose the next picture in the sequence;

b. to choose "which comes next" in a sequence of drawings or story-book pictures portraying a familiar event or story;

c. to be able to predict what happens when shown a video-tape or film strip which portrays a sequence of events.

Materials

Use sequences of simple pictures which tell a story or photographs of the children in short action-sequences. For Activity #3 below, you can make video-tapes which portray an action whose outcome is predictable. Film a short sequence, leaving a blank period between the action and its consequence during which the children can predict what the outcome will be. You might film, for example, a toy mechanical car approaching a stack of blocks, with the consequence that the blocks fall; or a child using a bicycle pump to blow up a balloon which ultimately bursts.

Activities

1. (For S.O. 6a)
Use pictures of action-sequences which are familiar. You might use the sequence described under Specific Objective 5, Activity #1 above, or you might make other sequences of familiar activities, e.g., a child putting on socks, shoes, and boots.
To begin, use a simple sequence of 3-4 pictures.

Place the first two or three pictures yourself.
Ask the child which of the remaining two pictures comes next.
After he places it, have him then place the last picture in the sequence.
It may be helpful to tell the sequence story or act it out in order to make this activity more meaningful to the child. If his choice was incorrect, complete the sequence for him, directing his attention to the order. Then, follow procedure as described, and have him try again.

2. (For S.O. 6b)
Follow the procedure described above, using commercially prepared sequences, as listed in Appendix A.

3. (For S.O. 6c)
Use the video-tape sequences.
After the first steps in a sequence of events has been shown, ask the children to predict what the outcome is going to be. Show the end of the tape to verify the children's responses.
If a child made incorrect responses, show the video-tape again and repeat the above procedure.
Encourage the children to act out the sequences.

Note: Frequently, children will predict outcomes different from those in the task, but equally acceptable. In such instances, the teacher might indicate that his answer is correct, and ask him to think of other possibilities.

Specific Objective 7: To be able to arrange a sequence of pictures which tells a story, with direct perceptual supports; e.g., different stages in the growth of a tree, in which the tree is seen as getting taller:

a. to arrange a short sequence of pictures (three);

b. to arrange longer sequences (four or five).

Materials

Use series of pictures which tell stories in sequential order in which the changes from one picture to another are clearly perceptually indicated in the picture; for example, sequences in which a plant is pictured in stages of growth, from small to large, or a snowman melting, pictured from large to small. You can use sequences of Polaroid pictures which you or the children make. You will need sequences which vary in length from three to five pictures.

Activities

1. (For S.O. 7a)
   Use sequences in which the changes from one picture to another involve an easily perceptible change; for example, a change in size or shape of an object.
   Begin with a sequence of three pictures. Put the first one in place yourself.
   Ask the child to choose and place the next picture from the two remaining.
   If he chooses correctly, ask him to place the last picture.
   If he chooses incorrectly, ask him if the sequence is correct.
   If he does not see the error himself, complete the sequence for him, explaining why you are placing them in this way.
   Remove the pictures, and repeat the procedure as above.

2. (For S.O. 7b)
   Repeat the procedure described in Activity #1 above, using a sequence of four, then five, pictures.
   You might use pictures, made by the class, of stages in the growth of a plant.

Specific Objective 8: To be able to arrange a sequence of pictures which tell a story, using a sequence which does not contain direct perceptual supports--

a. to arrange a short sequence (three);

b. to arrange longer sequences (four or five).

Materials

Use pictured sequences which tell a story, in which the correct order cannot be determined by directly perceptible cues in the pictures. You can use commercially available sequences, as recommended in the materials section of the Appendix, or photographed sequences may be made (see activities suggested for photographing in Sensory-Motor Integration (G.O. I, S.O. 6 and G.O. V, S.O. 2 and 3). You can also use familiar story books which portray simple stories in pictures. You will need two copies of each book. Separate the pages of one book, leaving the second one intact to serve as a model.

Activities

1. (For S.O. 8a)
   Use sequences which tell a story without using direct perceptual supports which allow the child to construct the correct order of the pictures. It must be a sequence which does not portray something getting larger or smaller.
   You can use pictures which tell a story, so that the child must understand the logical relations between the steps in the sequence in order to place the pictures in the appropriate sequence.
   Examples of such sequences might show a child getting ready for bed, sliding down a slide, going on a trip, etc.
   Begin with a sequence of three pictures. Put the first one in place yourself.
   Ask the child to choose and place the next picture from the two remaining.
   If he chooses correctly, ask him to place the last picture.

If he chooses incorrectly, ask him if the sequence is correct.
Try to determine the source of the error and explain why his choice was incorrect. Complete the sequence yourself, explaining why you are placing them this way.
Remove the pictures, and repeat the procedure.
Repeat the procedure, gradually increasing the difficulty of the sequences you give the child.

2. (For S.O. 8b)
   Separate the pages of one story book that is familiar to the child.
   Have the child order the pictures of the story.
   Compare the sequence he has made with the intact copy.

3. Follow the procedure for Activity #1 above, using sequences of four or five pictures.

General Objective VI: *To develop the logical foundations necessary for comprehension of concepts of number and measurement*. Through his contacts with the world of objects, a child acquires the experience and knowledge necessary for the development of the stable mental structures we think of as mathematical understanding. The ability to profit from formal instruction in mathematics a child receives during the elementary school years exists only after the acquisition and coordination of considerable earlier learning. A complete specification of precisely what a child must learn in order to be ready for logical, mathematical thinking awaits further advances in theory and research in cognitive development. However, we are in a position to take advantage of the progress in the field that has taken place over the past few years.

A good deal of the learning of a pre-school child seems to take place at the *perceptual level*. That is, a child's understanding of the relations between different aspects of his world depends very much on what he sees and experiences directly. For example, if you show a three- or four-year-old child two rows of chips, like this:

A   •   •   •   •

B   • • • • • •

and ask him which row has more, he is very likely to tell you that row A contains more chips than row B. He seems to believe that because row A *looks* longer, it contains more than row B. It is only later that he is able to go beyond this direct perceptual experience and understand that, in fact, row B contains more than row A.

Consider the following situation: Suppose one shows a child three sticks, A, B, and C, where A is the longest, B of medium length, and C the shortest. If you show a three- or four-year-old child A and B, probably he can easily judge that A is the longer one. Similarly, if you show him B and C, he can judge that B is longer than C. Given this information, however, he does not necessarily know that A is longer than C. He must juxtapose A and C and directly *see* which is longer in order to make that judgment. Again, his judgment must be based on *direct perceptual information*. Eventually a child is able to structure such information conceptually and perform the logical operations which lead to the judgment that A is longer than C without directly perceiving the comparison.

The instruction in number concepts in this section has been approached with the ideas described in the preceding paragraphs in mind. Complex operations such as adding and subtracting, or even counting correctly, depend upon a child's having taken in and organized a great deal from direct experience with objects. In order for a child to understand the simple concepts described in the following pages he must see the operations to which they correspond. In order for learning to occur, the same sequence may have to be experienced repeatedly, in many different contexts, using as wide a variety of materials as the teacher can manage. Frequent and consistent repetition of observation, practice, and experimentation with simple concepts of number and measurement should contribute to a child's ability to profit later from mathematical instruction in elementary school.

Some of the kinds of concepts which lead to the development of mathematical understanding have been described separately, under General Objectives I and II of the Conceptualization section. Since categorizing and systematic ordering (the areas covered in G.O. I and G.O. II) are logical operations necessary for acquisition of concepts of number, you may find it useful to combine or carry out concurrently activities described in those sections and those which follow.

Specific Objective 1: To make gross comparisons of quantity--

a. when shown two unequal quantities, to be able to point out which has "a lot" and which has "a little;"

b. to create collections of objects such that one has "a little" and one has "a lot;"

c. to be able to make judgments about collections of objects with different amounts so as to point out which has "more" than another.

Materials

Choose small objects which can be put into piles, e.g., candies, paper clips, crayons, pennies, etc.
Also use materials which can be poured, such as sand or water, and transparent containers with spouts for pouring these materials, e.g., measuring cups, glasses, jars, etc.
Clay, play-dough, or other solid materials can be used.

Activities

1. (For S.O. 1a)
Make two piles of objects, such as blocks or coins, one with many objects and one with a few. Make it clear that there are two piles by putting each one inside a hoop or a circle, or by piling each on a separate sheet of paper placed on the table in front of the child.
Using both gestures and speech, ask the child to show you which pile has "a lot." If possible, try to teach the child a word or phrase to name the larger collection. It may be "the big one," "a lot," or some other word or phrase. Which phrase you choose is not important, but BE CONSISTENT. Do not try to teach several labels at one time. If the child cannot choose the larger collection consistently in response to a word or phrase, use a gesture to indicate what is desired.

Repeat this activity many times, using different numbers of objects and different kinds of objects in different contexts.
Repeat, using water or sand poured into two containers of the same shape and size so that they each contain different amounts, one "a lot" and one "a little."
Repeat, using two clay balls which differ in size.
Continue until the child can tell which is "bigger" consistently with different kinds of materials.

2. Repeat the procedure described in Activity #1 above, but in each instance ask the child to show you which of the two collections was "a little" or is "the small one." If necessary, use gestures to indicate what is required. After the concept of "a little" is well established, repeat the activity, alternately asking the child to show you which of the two has "a lot" and which has "a little" (or using whatever labels or gesture you have chosen).

3. (For S.O. 1b)
Do this activity only after Activities #1 and #2 are mastered.
Ask the child to make a pile of objects which has "a lot" in it. Ask him to make another containing "a little." As in Activities #1 and #2, use whatever gestures are necessary to indicate what you mean.
Continue using different materials until the activity is mastered.

4. (For S.O. 1c)
Make two piles of objects as described in Activity #1 above, and indicate to the child which has "more." Repeat several times, each time showing the child which has "more." After several repetitions, make two piles which differ in quantity and ask the child to point to the one which has "more" himself.
Repeat with different materials until the activity is mastered - until the child can choose the correct pile in response to the command to find "more."
It may be too difficult at this time to teach the verbal label for the concept of "more" with children whose verbal skills are very limited. If a child makes no progress on this activity, then continue to use whatever word or gesture was established by Activity #1 above.

5. (For S.O. 1d)
Try this activity after Activity #4 above is mastered.
Ask the child to make two piles of objects so that one pile has more than the other. When he is finished, ask him to show you which has more. In the beginning, use whatever gestures are necessary to communicate what you mean.

Continue this procedure, using different materials, e.g., chips, pennies, paper clips, blocks, candies, water, sand, etc., until the child can perform the activity consistently.

Specific Objective 2: To have experience with matching, manipulating, removing, and replacing objects which occur in pairs. The objective is to demonstrate the notion of one-to-one correspondence, to show how objects can be put into pairs. Once the child has some exposure to this idea, the objective is to show that one-to-one correspondence is maintained even if the objects are moved around; that is, if one object is removed from each pair of a set of pairs, one-to-one correspondence is not destroyed. The objects can be replaced into pairs again, with none left over--

a. to be able to make a row of objects to match an identical row, with the rows close together - three or four inches apart. Each object in the model row should be different. You might have, for example, a model row containing a block, a toy truck, a ball, a cup, and a pencil.

b. to be able to make a row of objects to match an identical row with the rows far apart - one or two feet apart. Each object in the model row should be different, as in (a) above.

c. to be able to make a row of objects to match a model row in which all the items in the row are identical, e.g., all blocks of the same color, size and shape, with the rows close together (three or four inches apart).

d. to be able to make a row of objects to match a model row in which all the items are identical, e.g., all beads of the same color, size, and shape, with one row separated from the other by one to two feet.

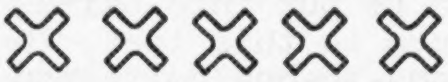
e. to be able to make a row of objects to match a model row, in which the items in the row are all different, with the duplicate row displaced to the side and separated from the model row by about six inches e.g.:

Model
Row: Block - Cup - Truck - Pencil - Eraser

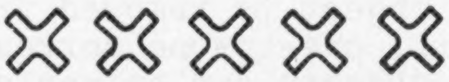
Child's
Row: Block - Cup - Truck - Pencil - Eraser

f. to be able to make a row of objects to match a model row, in which the items in the model row are identical with the duplicate row displaced to the side.

e.g.: Model Row:



Child's Row:



g. to experiment with one-to-one correspondence by putting objects that go together, e.g., cups and saucers, into pairs, breaking up the pairs, and then putting them together again.

h. to experiment with one-to-one correspondence with arrangements of objects that are separated in space.

Materials

For Activities #1 through #6, use any kind of small objects, e.g., coins, paper clips, beads, blocks, etc. For Activity #7, choose pairs of objects that go together, such as cups and saucers, nuts and bolts, pencils and erasers, juice and cups, milk and straws. For Activity #8, use a commercially available stacking toy (as suggested in Appendix A) in which the pieces can be stacked correctly only by attending to the correspondence between pegs and holes.

Activities

1. (For S.O. 2a)
Choose a set of objects in which each is different. You might have, for example, a block, a ball, a toy truck, a cup, and a pencil.
Put the objects in a row in front of the child.
Choose duplicates of the objects and make a row just like the model row three or four inches away.
Remove the objects from the duplicate row and tell the child he is to make a row just like the one you made.
Point out that he is to match the model row.

2. (For S.O. 2b)
Follow the procedure described in Activity #1 above, but ask the child to put his row twelve to sixteen inches away from the model.
With the objects separated, you must direct his attention to the one-to-one correspondence between items in the rows.

3. (For S.O. 2c)
Choose a set of small objects identical in all respects, e.g., blocks of the same size, shape and color.
Put some of the objects into a row.
Give the child duplicates, and ask him to make a row just like yours with his row three or four inches away from the model.
After the child makes his row to match, point out that his row has the same number of objects as yours.
Repeat the activity, varying the number of objects in the model from three to seven. In each instance, direct his attention to the fact that the rows have the same number of objects.

4. (For S.O. 2d)
Follow the procedure described in Activity #3 above but have the child make his row twelve to sixteen inches away from the model.

5. (For S.O. 2e)
Follow the procedure described in Activity #1 above, but have the child make his row six to eight inches from the model, but displaced to the side.
e.g.: Model
Row: Block - Cup - Saucer - Pencil

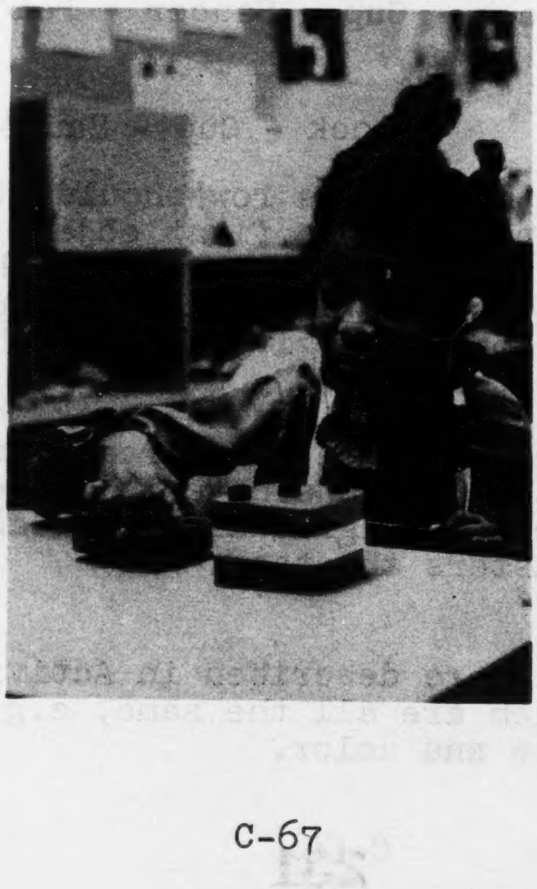
Child's
Row: Block - Cup - Saucer - Pencil

Indicate where the child's row should start, by using gestures or by placing the first object yourself. If he still doesn't understand, complete the entire row yourself, directing his attentionnto your actions.
Then remove the objects, give them to the child and ask him to make the row as you did.
After he correctly completes the task, point out the one-to-one correspondence and direct his attention to the fact that the two rows have the same number. Start with these objects and gradually increase the number as the child masters the task.

6. (For S.O. 2f)
Follow the procedure described in Activity #5 above, but use objects which are all the same, e.g., blocks of the same size, shape and color.

7. (For S.O. 2g)
Have the child put together pairs of objects that go together, such as cups and saucers. Have him take the cups off the saucers and place them together in another location.
Then have the child replace the cups on the saucers, drawing the child's attention through gestures or language to the fact that there is still one cup for each saucer.
Do this activity several times, using different numbers of pairs of objects (three to seven) and other pairs of objects, such as nuts and bolts, knives and forks, dolls and dresses, milk containers and straws, etc. Each time, direct attention to the fact that there is the SAME NUMBER of objects, no matter how they are moved around.

8. (For S.O. 2h)
Show the child a stacking toy where the toy has been stacked by putting pegs into holes.
Show him how the pegs of one piece fit the holes of another. Put two pieces which fit together side by side on the table, and point out that there is a correspondence between the number of pegs in one piece and the number of holes in another. Point out that there is the SAME NUMBER of pegs and holes. Repeat this procedure for each matching set.
Put the first two or three pieces on the tower, and have the child complete it.
Then remove all the pieces and have the child build the entire tower.

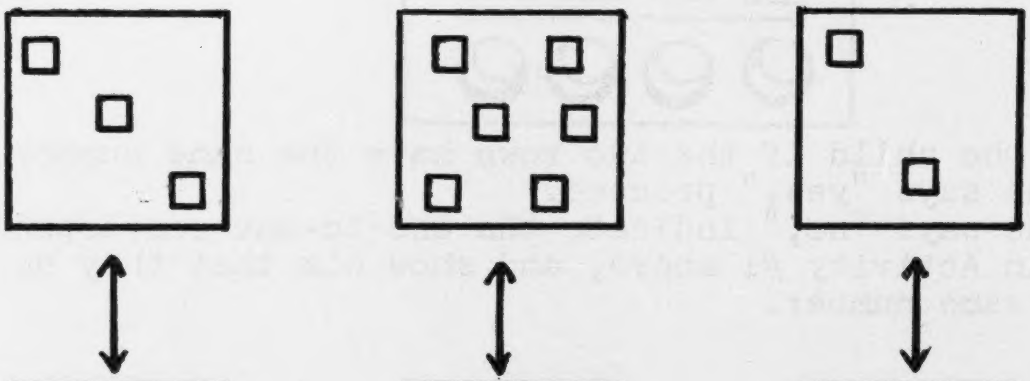


Specific Objective 3: To have experience arranging and re-arranging sets of objects; to develop the basis for the concept that the rearrangement of a number of objects in space does not change the number of objects.

Note: Most children below the age of 6 should not be expected to master this concept. The goal here is for the teacher to provide the child with a wealth of experiences with the rearrangement of objects in space in order to help him in the natural development of the concept.

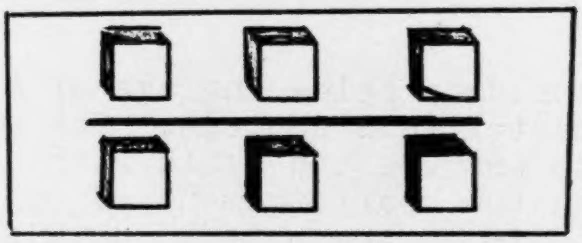
Materials

Use any kind of small objects that can be lined up in rows, such as blocks, chips, cups, coins, etc. For some of the activities, use pairs of objects that go together, such as cups and saucers, nuts and bolts, pencils and erasers, milk and straws, etc.
There are also a number of printed materials commercially available which are specifically designed to be used to teach the notion that number remains constant across spatial transformations of sets of objects. You can make similar materials yourself by drawing or photographing different arrangements of the same number of objects. A matching pair of such pictures might look like this:



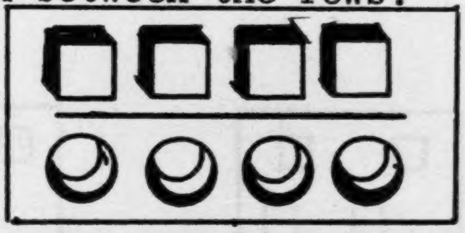
Activities

1. Take three blocks and put them in a row on the table. Take three more blocks and put them next to the first row:



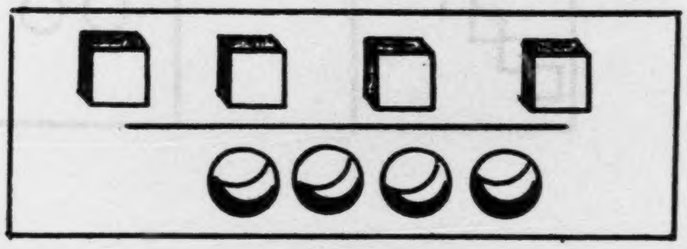
Put a string, tape, ruler or other marker between the two rows so that it is clear that there are two rows of blocks.
Point out the one-to-one correspondence between the blocks in the two rows. Tell the child, using words or a gesture if necessary, that the two rows have the same number of items.
Repeat the above procedure, with 4 blocks in each row, then 5 blocks in each row.
Repeat, using different objects, e.g., pennies, cups, pencils, etc.
Repeat several times with different objects in each row, e.g., blocks in one row and coins in another.
These activities should help the child to comprehend what is meant by "same number."

2. Again, make two rows of four objects each, e.g., blocks and coins. Put the two rows on a sheet of paper, with a line drawn between the rows:

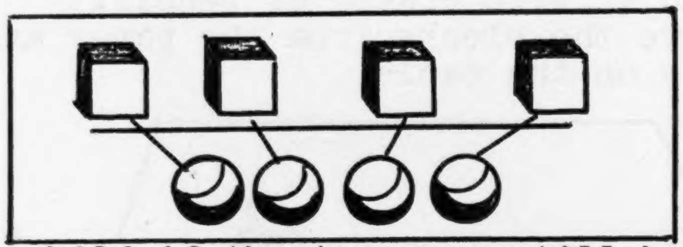


Ask the child if the two rows have the same number.
If he says "yes," proceed.
If he says "no," indicate the one-to-one correspondence, as in Activity #1 above, and show him that they do have the same number.

Push the objects in one row close together.

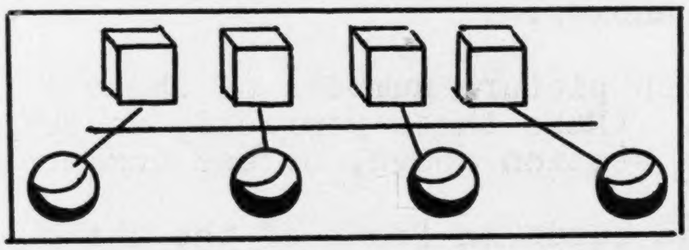


On the sheet of paper, draw or have the child draw lines between objects in the two rows, so that the array looks like this:



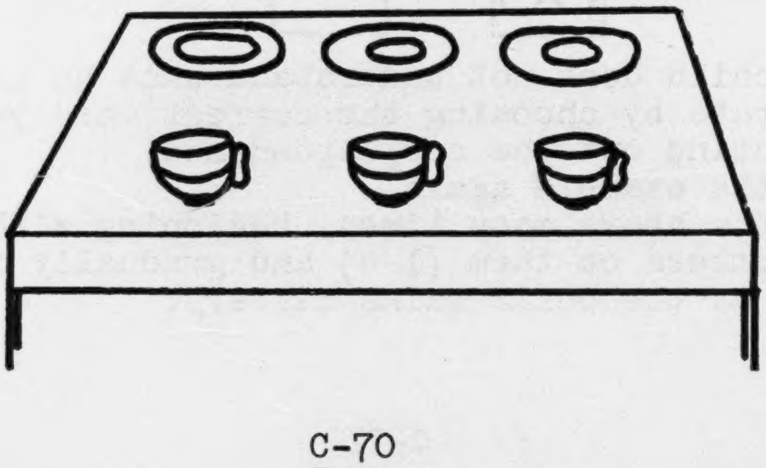
Ask the child if the two rows still have the same number. If he says "yes" indicate that he is correct. If he says "no", return the objects to their original aligned positions, as in Activity #1 above, and point out that they do have the same number. Then push them together again and point out that one-to-one correspondence is maintained and that the number is the same.

Repeat the above procedure on a new sheet of paper. Instead of pushing one row together, spread the items apart, so the array looks like this:

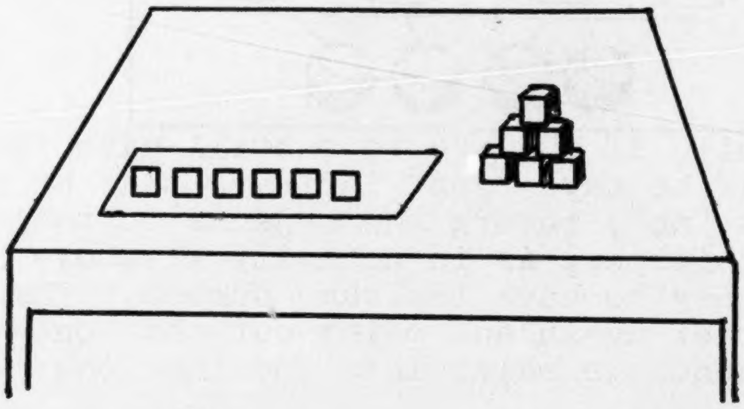


Again draw pencil lines between objects in the two rows, as in the previous example, to show one-to-one correspondence.
Repeat the procedure on the preceding page many times, using different kinds and numbers of objects. Vary the number in each row from three to seven.

3. Repeat the procedure described in Activity #2 above, using objects that go together, such as cups and saucers, nuts and bolts, pencils and erasers, etc. Matching rows using cups and saucers might look like this:

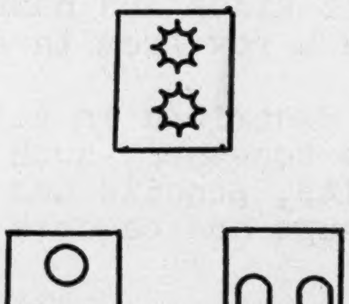


4. Have the child put five or six blocks in a row on a piece of paper.
Have him mark the position of each on the paper by drawing around it with crayon or pencil.
Have him remove the blocks from the paper and put them in a pile on the table.



Ask him, using whatever speech or gesture he has learned from previous activities, whether he still has the same number of blocks he had before.
Have him replace the blocks in the marked positions to check his answer.

5. Use cards which picture numbers of objects in different arrangements. (Make these yourself, as described in the Materials section above, or use commercially prepared cards.)
Put one of the cards in front of the child.
Present two others, including one with the same number of pictures or blocks as the target card, and indicate that he is to choose one which has the same number as the target. For example:



If the child does not understand what he is to do, demonstrate by choosing the correct card yourself and pointing out the correspondence.
Repeat the example again.
Repeat the above many times, beginning with cards with small numbers on them (1-4) and gradually increasing up to 9 as the child gains mastery.

Gradually increase the number of choices from two to five.

As the child gains mastery, vary the task by asking him not only to choose the correct card, but also to build a stack of blocks with the same number of blocks in it to correspond to the numbers on the card.

Specific Objective 4: To be able to choose "enough" of one kind to go with a particular number of the other. With objects that go together, e.g., cups and saucers.

Materials

Choose sets of objects that go together, e.g., cups and saucers; nuts and bolts, dolls with hats or beds; pencils with erasers, etc.

Activities

1. Use as materials a set of 6 to 8 cups and 6 to 8 saucers - or other materials, as described in the list of materials above.
   Put the saucers together in a stack.
   Put three cups in front of the child.
   Take a pile of three saucers all at once from the stack and put each one beside a cup. Indicate to the child that you have chosen the same number of saucers as you have cups. Indicate by pointing to the saucers that you are choosing the same number of saucers as you have cups. Demonstrate that you made the correct choice by placing a saucer under each cup.
   Replace the saucers in the stack.
   Ask the child to do what you did - to remove all at once the same number of saucers on the stack as there are cups on the table.
   If the child's selection is far from accurate, point out, using gestures, that he chose "too many" or "not enough." Ask him to choose again. If the child has difficulty, demonstrate again, counting each cup on the desk - one cup, then a corresponding saucer from the pile; a second cup, and its saucer from the pile; a third cup, and its saucer. Then pick the three saucers off the pile.

Continue the activity, putting four cups on the table to be paired with the saucers.
Repeat, using different sets of objects - dolls and beds, pencils and erasers, children and milk, cookies, or napkins, etc.
Repeat, varying the number of objects to be matched from five to eight.

Specific Objective 5: To be able to make judgments of number equivalence across time--

Materials

Use small objects that the children can handle easily, such as beads, blocks, pennies, chips, crayons, etc. You will also need transparent containers, such as plastic or glass bowls or jars, and pieces of cloth preferably velvet or felt.

Activities

You will need two transparent jars into which you can drop small objects, such as beads or blocks. Keep one jar and give the other to the child. Begin by dropping a bead into your jar. Have the child drop one bead into his jar. Indicate that he is to drop one bead into his jar each time you drop one into yours.
After three or four beads are in each jar, ask, using gestures or speech, whether the two jars have the same number of beads.
Have the child remove the beads from both jars and line them up on a piece of cloth in one-to-one correspondence in order to see if his answer was correct.
Replace your beads in your jar and the child's beads in his jar.
Repeat the procedure described above in which you and the child simultaneously put beads in the two jars, one bead at a time.
After placing several more beads in the jars, ask him whether the two jars have the same number of beads in them.
Have him check his answer by removing the beads and lining them up in one-to-one correspondence.
If you think it is appropriate, ask the child to tell you the reason for his answer.

Specific Objective 6: The ability to make judgments of number or quantity across time --

Materials

Use beads, blocks, or other small objects and transparent containers, such as plastic glasses or jars.

Activities

1. You will need two transparent jars into which you can drop small objects, such as beads or blocks.
   Keep one jar and give the other to the child.
   Begin by dropping a bead into your jar.
   Have the child do the same.
   Indicate that he is to drop one bead into his jar each time you drop one into yours. At a point when you and the child have the same number in your jars, have him observe while you put an extra bead into your jar.
   Ask him if you have the same number of beads in your jars.
   Remove the beads and line them up into one-to-one correspondence to show the child whether or not his answer was correct.
   If his answer was incorrect, ask him if the two rows of beads have the same number while they are still lined up in one-to-one correspondence.
   Replace the beads in the jars and ask again if they have the same number.
   Repeat the above procedure with the following difference: Ask the child which jar has "more," rather than asking if they have the same number.
   Use the procedure described above to check the child's answer.

2. Repeat the above procedure several times, using different kinds of objects for counting and different kinds of containers.
   Start with small numbers of objects, and as the child gains mastery, increase the number used on succeeding trials.

Specific Objective 7: To experiment with size and distance judgments.

Materials

Use games or objects which encourage the child to pay attention to, and estimate, size and distance, e.g., ring toss, nuts and bolts, dolls and clothing of various sizes, a fishing rod with a magnet attached to the end of a string with metal objects to pick up, etc.
The "Match and Measure" book suggests a number of activities which will help meet this objective. (See Appendix A).

Activities

1. Collect a variety of small metal objects that can be picked up with a fishing rod which has a magnet on the end of the line.
   Put a metal object for the child to pick up three or four feet away from him.
   Ask him to pick it up.
   As he manipulates the rod to pick up the object, gesture when he is "too far" away and when he is "getting closer."
   Try to draw his attention to the distance between the magnet and the object as he moves the magnet toward the object.
   Continue the game, using different kinds of objects.
   Vary the distance from the child to the object to be picked up, from very close to as far as the fishing pole will reach with the child's arm extended.

2. Choose a set of nuts and bolts of different sizes.
   Give the child one of the bolts (or one of the nuts) and ask him to choose the nut (or bolt) which just fits.
   Have him try on his choice.
   If it does not fit, point out whether it is "too big" or "too small."
   Ask him to choose again and try his choice on again.
   If he is correct, give him a nut or bolt again and repeat the above procedure.

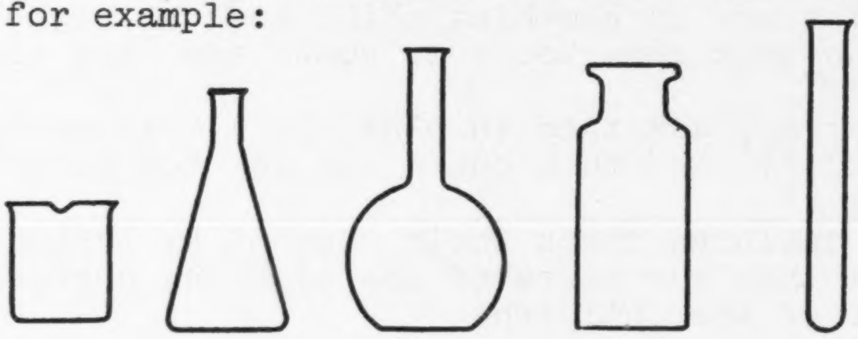
3. Have the children play Ring Toss, drawing their attention to the distance the rings fall from the stake.
   Have them toss from close to the stake and then farther from the stake, again drawing their attention to the distances involved.

4. Have the children experiment with sizes by trying on each other's coats and shoes or boots.
   Point out there is clothing which is "just right"- which "fits"-and that some boots or coats are "too big" or "too small".
   From an array, ask them to pick out a coat or shoe which will fit and then one which is "too large" or "too small."
   Have the children check their choices by trying them on.
   Point out that the sizes of the clothing correspond to the sizes of the children.

Specific Objective 8: To build foundations for judgments of quantities in volume.

Materials

Use sand, water, or quantities of small objects (such as beads and beans) and containers of different sizes and shapes, for example:



Activities

Give the child a container and ask him to fill it with sand or water.
Give him other containers of different sizes, same shape, and point out what happens when the sand or water is poured into a container which is a different size or shape.
If he is pouring into a larger container, demonstrate that the contents of the first container do not fill it.
If he is pouring into a smaller container demonstrate that the contents of the first container spill over from the smaller container.
Give him a container smaller than the original and ask him what will happen if he pours the substance into the smaller container.
Have him verify his response doing the activity himself.
Give him a container larger than the original and ask him what happens if he pours into the larger container.
Have him verify his response by doing the activity himself.

Specific Objective 9: To experiment with judgments of equivalence and non-equivalence using a balance scale--

a. to experiment with making judgments of equivalence and non-equivalence using discrete objects of the same size and weight;

b. to experiment with making judgments of equivalence and non-equivalence using many objects, of different sizes and weights;

c. to experiment with making equivalence and non-equivalence judgments using continuous quantities, e.g., water or sand.

Materials

Use a balance-scale and small objects readily available in the classroom. "The Balance Book" -- Teacher's Guide has a number of ideas for balance activities (see Appendix A).

Activities

1. (For S.O. 9a)
   Choose two objects which are very different in weight, e.g., a pencil and chalkboard eraser.
   Put one on each side of the balance.
   Gesture that one of the objects makes that side of the scale go down.
   Give the child the two objects, pointing out that one feels different.
   Point out that the one that makes the scale go down is the "heavy" one.
   Give the child two more objects which are obviously different in weight and repeat the above procedure.
   Repeat with different objects until you believe the child understands what you are doing.
   Give the child two different objects which are of different weights and ask which is "heavy" - which will make the side of the scale go down.
   Have the child put one of the objects on each side of the balance in order to check which actually is heavier.
   Have him experiment with different kinds of objects, especially pairs of objects in which the smaller of two objects is the heavier.

2. (For S.O. 9b)
   Choose a collection of small objects, e.g., paper clips, coins, beads, etc.
   Make two piles of objects. Ask the child to predict which pile will be heavier and make the side of the balance scale go down.
   Ask the child to put one of the piles in each side of the balance to see which is actually heavier.
   Ask him to make the two sides balance by adding to the lighter side.
   Repeat the above with different kinds of materials.
   Include larger, light objects (empty box, plastic jars) and small, heavy objects (bolts, locks).

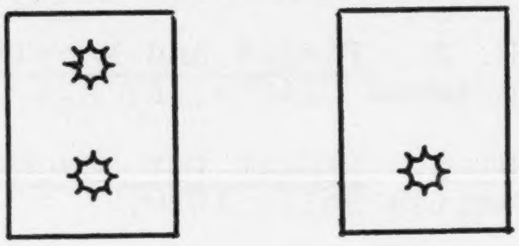
3. (For S.O. 9c)
   Repeat the procedure in Activity #2, but using containers with continuous quantities, e.g., water or sand.

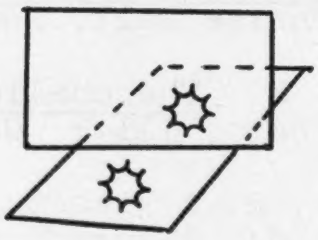
4. Permit the child to experiment independently (when appropriate) with the scale and varied objects and materials.

Specific Objective 10: To be introduced to, and experiment with the concept of symmetry.

Materials

Use simple pictures and designs, like the example below, and a small mirror, which the child can move around in different directions and at varying angles on the pictures. A set of materials of this type is available commercially as "Mirror Cards." The accompanying Teachers Guide describes activities using the cards (see Appendix A).





Activities

1. Give the child two cards, with one a whole design and one with a partial design, as in the example above. Show the child how the mirror can be placed on card 1 so as to make it look like card 2.
   Give him the mirror and ask him to place it to make card 1 match card 2.
   Gradually increase the difficulty of the problems you give the child.
   Let him experiment with the mirror and his own designs.

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SENSORY-MOTOR INTEGRATION

Penny Axelrod Socher, M.A.

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Introduction

For the first two years of a child's life the growth of cognitive functioning is dependent upon the child's physical interaction with the people and objects in his environment. For the child this is a time of learning about all that is around him by touching, tasting, smelling, listening and looking. Although most children of school age have passed through this stage--the period of sensory-motor development--for children with special learning problems the need for action oriented learning may extend well beyond age two.

The objectives and activities that follow in the Sensory-Motor Integration section of the curriculum are divided into several subdivisions: manipulative skills, rhythmical movements, body awareness and writing skills. They have been designed to foster the child's interaction with many different objects and with many types of movement for it is through this action that the child builds the more complex cognitive structures of symbolic thought. Through playing with the objects he will discover how he can manipulate objects to make them work as well as to develop his muscular strength and eye-hand coordination.

It is also during these first few years that the child learns that he is a physical entity separate from the people and things around him, that he has a body of his own whose movements he can directly control, that his body has boundaries and that it fills up a certain space.

The later part of the Sensory-Motor Integration section is directed towards the development of fine motor skills which the child will frequently be called upon to use in his school work. At approximately five years of age the child is beginning to develop the skilled coordination of the small muscles in the hand. Efficiency and ease in performing a sensory-motor task using fine motor coordination is the overall goal of this set of activities.

Because both muscular and cognitive development are dependent on the child physically interacting with his environment and the objects in it, we strongly urge you to make as many as possible of the objects that are suggested in the curriculum available in your classroom for the children's use. By providing guidelines for the use of the materials (e.g., how to replace the parts, where to return them when finished playing with them), the child will be able to independently explore the materials.

Manipulation of many different types of materials becomes crucial in light of the Piagetian hypothesis that the child internalizes what he has learned through the physical interaction with objects in his environment (Flavell, 1963). From the physical interaction he will gain a working knowledge of those objects when he encounters them at a later time. For example, through playing with an eggbeater the child learns that he can make the blades turn by rotating the handle. When the child sees an eggbeater at a later time he will have internalized the knowledge of what would happen if he turned the handle. This is an efficient and crucial foundation upon which the child bases the more complex levels of operational thinking.

Because some objects are more complex than others the child may have to play with certain objects many more times than with others to really learn all about the ways in which the object can be manipulated and all the things they can do. The teacher, by providing many and varied opportunities for use of these objects is giving the child the raw material for more complex cognitive development.

General Objective I: To develop manual strength and dexterity with minimal use of vision. The objective in this section is to promote the development of the foundational skills normally necessary for eye-hand coordination and for using a writing tool. The purpose of the activities in this section is to develop muscular strength and coordination in the child's hands, where the use of vision may be helpful but is not a necessity for performing the tasks.

Specific Objective 1: Make isolated movements of individual fingers.

Materials

Any materials that can be manipulated with one finger at a time, such as a piano, typewriter, telegraph key.

Activities

1. Touch the thumb and fingers of one hand with the thumb and fingers of the other hand in succession. The child may begin with the little fingers or with the thumbs.

2. Touch the thumb to all of the fingers of the same hand in succession.
   The child may begin with the thumb touching the forefinger first or with the thumb touching the little finger.
   Have the child do this activity first with his preferred hand, then with his non-preferred hand.

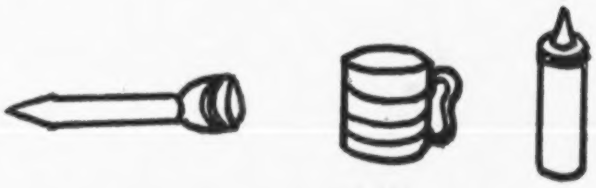
3. Hold the hand flat on the desk.
   Raise and lower one finger keeping all other fingers still.

4. At the piano or typewriter, press one key at a time.

Specific Objective 2: Grasp and release objects with the whole hand.

Materials

Any objects that can be squeezed with the whole hand, such as a small sponge, strip of foam rubber, non-hardening clay, food baster (clear plastic bulb type) flour sifter, soft plastic container with a spout.



Activities

1. Squeeze any of the above materials, using the whole hand. This activity is often used by physical therapists to activate and strengthen the small muscles of the fingers and hand.
   Squeeze the objects first with both hands. As strength develops squeeze with the preferred hand, then with the non-preferred hand.

2. Using both hands squeeze the sponge to transfer liquids from one container to another. As the child's manual strength develops have him use only one hand.
   Liquid, colored with vegetable coloring, will make the task more visually interesting to the child.

3. Squeeze any of the above materials holding one in each hand.
   Have the child squeeze and release the object several times.
   Be sure not to tire the child's hands with this activity as it takes quite a bit of muscular strength.

4. Using a hand model paper punch, make holes at random in a piece of paper.

5. Using a flour sifter, squeeze and release the mechanism to sift flour, sugar, sand, salt, etc.
   Young children will probably have to do this using both hands.

Specific Objective 3: Move the thumb in opposition to the four fingers.

Materials

Hand puppets -- where the head is manipulated by four fingers and the lower lip is manipulated by the thumb.

Activities

1. Manipulate the puppets so that they appear to be talking.

Specific Objective 4: Move the thumb and little finger in opposition.

Materials

Hand puppets -- where the puppet arms must be manipulated by the thumb and little finger.

Activities

1. Manipulate hand puppets in imitation of clapping.

Specific Objective 5: Move the forefinger in and out while the fist is clenched.

Materials

Any instrument where the movement of the forefinger causes a mechanical action. A water gun or "Magic Fingers" might be used.

Activities

1. Manipulate the water gun and "Magic Fingers" in preparation for later use in G.O. II, which calls for the coordinated use of vision and one hand.

Specific Objective 6: Rotate the wrist--

a. clockwise;

b. counter-clockwise.

Materials

Threaded objects which can be screwed together, such as nuts and bolts, plastic jars with screw-top lids in assorted sizes, or other objects which require a rotating wrist action for operation such as a juicer, door knob, or wind-up toy.

Activities

1. (For S.O. 6a)
   Screw caps onto jars.
   Screw nuts onto bolts.

2. (For S.O. 6a)
   Open a door by twisting the door knob clockwise.

3. (For S.O. 6b)
   Unscrew caps from jars.
   Unscrew nuts from bolts.

Note: For children with physical handicaps of the arms or hands, anchor jars, bolts, etc. in a base of heavy wood or embed them in a wedge of clay.

4. (For S.O. 6a and b)
   Squeeze a halved orange on a juicer.

   Photo 1. - Knife slicing through orange.
   Photo 2. - Halved orange placed on juicer.
   Photo 3. - Child turning orange-half on the juicer.
   Photo 4. - Child pouring juice into glass.
   Photo 5. - Child drinking juice.

Note: Polaroid photos may be used in conjunction with Conceptualization, G.O. V. These photos are more effective if taken in color.

Specific Objective 7: Rotate both wrists counter to one another.

Materials

Any soft fabric that can be twisted, such as a face cloth or strip of foam rubber. The toy, "Turning," a strip of diagonally-cut wood segments held together by an elastic, is especially suited to this activity as it may be held in both hands and twisted.

Activities

1. Roll up a wet face cloth.
   Wring it out over a container by placing one hand on each end of the cloth and turning them, one hand moving in the opposite direction from the other hand.

2. Hold the "Turning" toy in both hands and rotate the wrists counter to one another.

Specific Objective 8: Grasp and release with thumb and forefinger --

a. large objects;

b. small objects.

Materials

Any large or compartmented containers (jars, boxes, muffin tins, egg cartons). A variety of large objects (1" cubes, beads) and small objects (beans, beads, peas, etc.).

Activities

1. (For S.O. 8a)
   Fill a shallow bowl or box with the large objects. Have the child pick up objects from the shallow container and put them in the compartments of the tin or egg box.

2. (For S.O. 8b)
   Have the child pick up small objects and put them in the tin or egg box compartments.
   This activity may be used in connection with Conceptualization, G.O. I, S.O. 1.

Specific Objective 9: Use the thumb and forefinger to rotate objects--

a. clockwise;

b. counter-clockwise.

Materials

A variety of objects which can be manipulated with the thumb and forefinger, such as small nuts and bolts, toy or discarded watches, small plastic bottles with screw-on tops, etc.

Activities

1. (For S.O. 9a)
   Using only the thumb and forefinger, screw on bottle caps, screw nuts onto bolts, wind a watch.

2. (For S.O. 9b)
   Using only thumb and forefinger, unscrew bottle caps, nuts from bolts, etc.

Specific Objective 10: Oppose thumb and bent forefinger or middle finger.

Materials

Objects which can be opened and closed by the manipulation of the thumb and forefinger or middle finger, such as a spring clothespin, hair clip, child-sized scissors or double-handled scissors.

Activities

1. Open and close a clothespin or hair clip.
2. Open and close scissors.
   If the child needs help in mastering the muscular action necessary to open and close a scissors use a double handled scissors so that you can guide his hand movements.

General Objective II: To develop the ability to coordinate the use of the eyes and one hand in performing manipulative tasks.

Specific Objective 1: To pick up objects with the hand and drop into a container.

Materials

A selection of large objects that can easily be grasped by a child's hand, such as bean bags, two 3" diameter balls. A selection of small objects, such as marbles, paper clips. A variety of containers to hold the objects.

Activities

1. Pick up objects with the whole hand and release them into a container.
   Vary the activity by using many different objects and containers until the child can easily grasp and release both large and small objects.

Specific Objective 2: To stack 3 to 10 three-dimensional forms.

Materials

Wooden or cardboard blocks of various sizes.

Activities

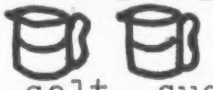
1. Demonstrate by placing three 1" cubes on top of one another.
   Ask the child to do the same thing.
   Have the child make as large a tower as he can.
   Do this activity with blocks of different dimensions.
   A 4-year-old child should be able to stack ten 1" cubes.
   If a child has severe coordination problems, begin by having him stack objects in a cup-rack or something that has tall sides.
   When he has succeeded at this task have him stack large cardboard blocks.
   When he is able to stack larger blocks do the activity again using 1" cubes.

2. Demonstrate by placing three 1" cubes on top of one another.
   Ask the child to make a tower like yours.
   Add a block to your tower.
   Have the child add one to his.
   See which of you can make the tallest tower before it topples over.

3. Follow the same procedure as in Activity #2 above, using the ½" cylindrical and square beads.

Specific Objective 3: To pour dry material from one container to another.

Materials

Spouted measuring cups with large handles , two of the same size,  , one larger, one smaller . Sand, rice, salt, sugar or any similar dry material; large flat box; large-mouth jar.

Activities

1. Put a measuring cup in a flat box.
   Transfer the dry material from a measuring cup of the same size as the one in the box to the cup in the box, trying not to spill any material.
   Fill the measuring cup ½ full.
   It is easier to pour sand or salt than rice or beans.

2. Pour from one large measuring cup to a smaller cup.
   The large cup should be filled with as much material as the small cup can hold.

3. Pour from one large measuring cup to a small cup.
   The large cup should be filled with more material than can be held in the small cup.
   The teacher should direct the child's attention to the fact, that although the cup he is pouring from is not empty, the cup he is pouring into may be full, and he has to stop pouring, otherwise he will spill the contents.

4. Pour dry material back and forth from one measuring cup to another of the same size, holding a cup in each hand.
   Try not to spill any material.

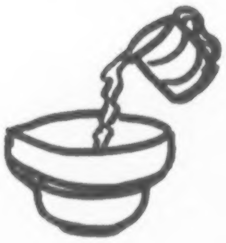
Specific Objective 4: To pour liquids from one container to another.

Materials

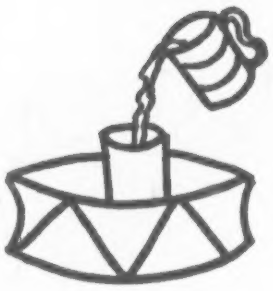
A large container capable of holding water, e.g., plastic or metal bowl, rubber dish pan.
Some liquid (water, orange juice, milk), and spouted measuring cups or pitchers.

Activities

1. For children who have poor coordination; pour water from a measuring cup into a large container.
   As the child is able to transfer liquids from one container to another without spilling, use smaller and smaller containers.



2. Pour water into small containers, such as glasses, cups, small-mouthed jars, paper cups which are placed in a large water-holding container.
   When the child is able to pour liquids without spilling any, allow him to pour juice or milk at snack time for the other children.



Specific Objective 5: To pick up with the thumb and forefinger and drop small objects into a container.

Materials

Any variety of small objects, such as marbles, ½" beads, bolts or nuts, erasers.
Several bottles or jars with large, medium, and small mouths, polyethylene tubing.

Activities

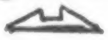
1. Give the child a few small objects in a box.
   Pick up the objects from the box and drop them into a large-mouth bottle.
   As the child is able to do this easily, use smaller-mouth bottles.

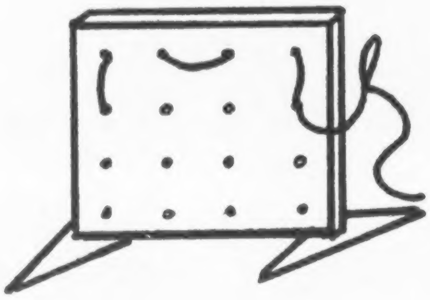
2. Two children, or a teacher and child can do this activity by taking turns adding objects to the same bottle.

3. Each of two children or teacher and child should have his own bottle.
   Alternate dropping an object into your own container.
   You drop a marble in your bottle, the child drops a marble in his bottle, and so on.
   For further description of this task see Conceptualization, G.O. VI, S.O. 5.

Specific Objective 6: To insert small objects into stationary openings.

Materials

Any stationary object with small openings into which a lace or peg can be introduced, such as eyelets, pegs with holes , macaroni or plastic tubing glued to heavy board, or an upright piece of peg board. Make a stand for the $\frac{1}{4}$" peg board by cutting two 2"x4" pieces of wood into this shape  . Stand the pegboard between the two supports.

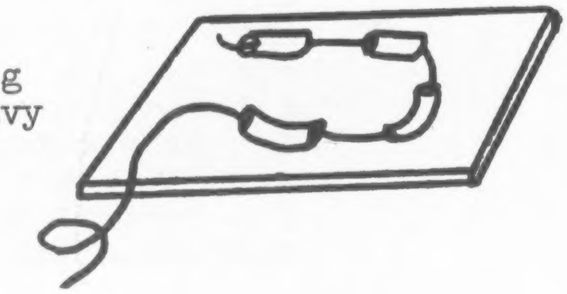


Activities

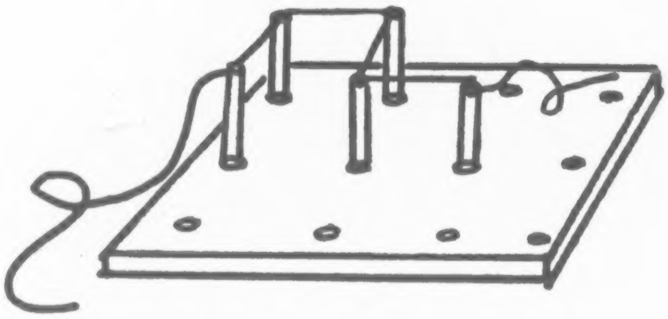
1. Thread a lace in and out of the holes in an upright piece of pegboard.

2. Using standard-sized pegs and pegboard, place pegs into the holes in the pegboard.

3. Thread a lace through the plastic tubing or macaroni, which has been glued to heavy board.

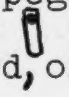


4. Thread a lace through the holes in standing pegs.



Specific Objective 7: To insert small objects into small stationary openings in sequence.

Materials

Any stationary objects with small openings into which a lace or peg can be introduced, such as eyelets, pegs with holes  , macaroni, or plastic tubing glued to heavy board, or an upright piece of pegboard.

Activities

1. Place a few pegs (4 to 6) in a pegboard. Thread laces through the "eyes" (holes) in the top of the pegs in a sequence. The sequence may be up and down rows or from left to right across rows. As the child masters the task let him add more pegs.

General Objective III: To develop the ability to coordinate the use of the eyes and the integrated use of both hands. This ability is an essential preliminary skill for writing. The eyes provide information, and the hands must work together, one holding the paper, the other manipulating the writing tool, to produce the written material. The following activities are designed to provide the child with many pre-writing opportunities for strengthening this action.

Specific Objective 1: To insert small objects into small openings with the integrated use of both hands.

Materials

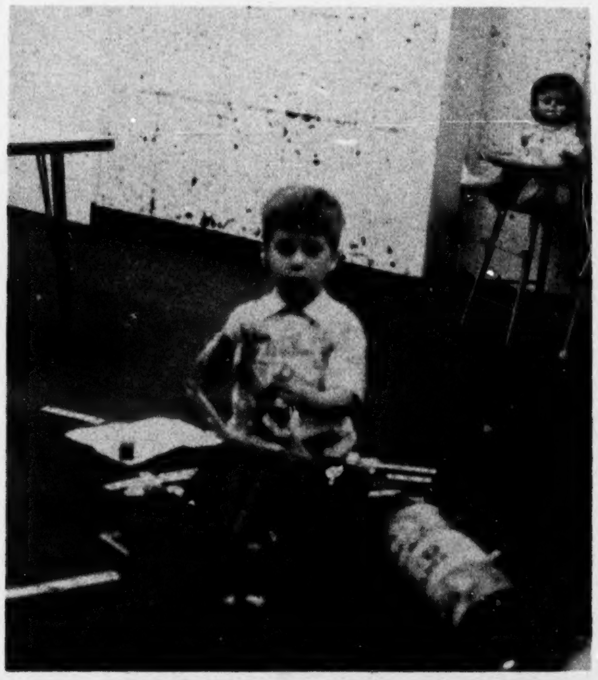
A variety of objects that can be put together by inserting one into another, such as nuts and bolts, snaps, zippers, button and button-holes, beads and laces, padlocks and keys.

Activities

1. Use both hands to open a padlock.
   Hold the padlock in one hand and manipulate the key with the other hand.

2. Use both hands to thread beads.
   Hold the beads in one hand and the shoe lace in the other.

3. Use both hands to join nuts and bolts.
   Hold the bolts in one hand and manipulate the nut with the other hand.



4. The manipulative activity of fastening clothing is one with which young children often have great difficulty.
   It is easier if they learn to fasten clothing when they are not wearing it as they can better see what they are doing, and the clothing can be kept stationary. It won't be in a constant state of movement as it would if they were wearing it.
   Only later, when the child has mastered the muscular activities of opening and fastening buttons, zippers, snaps, etc., should he try it on clothing that he is wearing.

   Place clothing that can be buttoned (snapped, zipped, laced) on a flat surface.
   Use both hands to button the clothing.
   Insert one side of the zipper into the other and work the zipper up and down.
   Press the snaps together.
   Thread the laces and tie a bow.

5. When the child is able to fasten clothing that he is not wearing, have him practice using clothes that he can put on over his regular clothing, such as an adult's shoe, shirt, jacket, etc.

Specific Objective 2: To coordinate both hands to insert objects into and out of small openings in sequence.

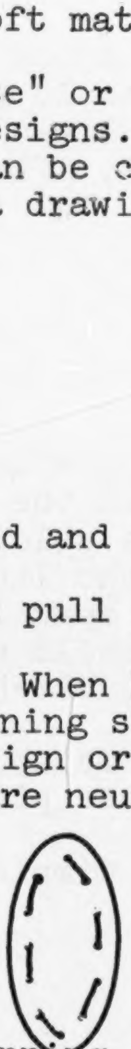
Materials

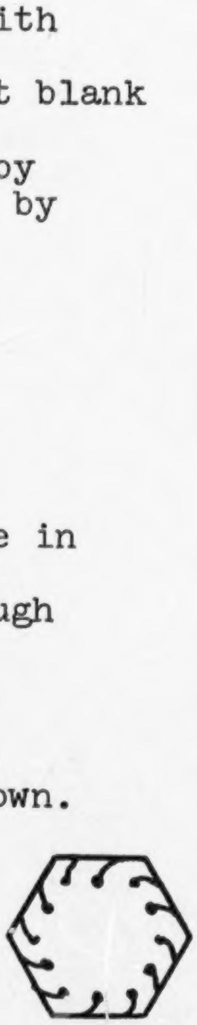
Shapes made of rigid "Masonite", or soft material with holes placed about 1" to 1½" apart.
You may paint designs on the "Masonite" or leave it blank for the children to draw their own designs.
Sewing cards of cardboard or cloth can be created by punching holes along the outline of a drawing made by the children.

Activities

1. Hold the card or board in one hand and the lace in the other.
   Insert the lace with one hand and pull it through the hole with that same hand.
   Demonstrate the overhand stitch. When he has mastered that, demonstrate the running stitch.
   If the child is distracted by design or color, begin by lacing materials which are neutral brown.

   As an additional guide for the child you might draw a line between every other two holes (running stitch) or from every hole to the edge of the shape (overhand stitch).


running stitch


overhand stitch

   After demonstrating the stitches have the child cover all of the drawn lines with his lace. If he does not cover a drawn line with his lace, then he has done the stitch incorrectly.
   When the child is able to do both stitches without the guide lines have him design his own patterns.

Specific Objective 3: To oppose thumb and bent forefinger or middle finger to manipulate a scissors within a limited area.

Materials

A series of broad parallel lines, printed or hand-drawn. The lines should be 1" apart, ½" apart, ¼" apart. Simple hand-drawn or printed line drawings, child-sized scissors and, if necessary, a double-handled scissors.

Activities

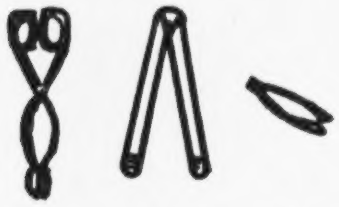
1. Beginning with the lines 1" apart, have the child cut inbetween the two lines.
   As he is able to accomplish this task by cutting within the lines, give him the lines drawn ½" apart, then ¼" apart.
   If the child needs help in manipulating a scissors, use a double-handled scissors.
2. When he is able to cut within lines, have him cut out simple pictures trying to cut on the line.
3. Cut out simple hand-drawn or printed line drawings.

General Objective IV: To develop the ability to utilize a tool to pick up and place objects. The following activities are designed to increase the child's manual dexterity and strength. The coordination of hand movements and vision is also required. It also provides opportunities to use tools as an extension of the hand, a prerequisite skill to writing.

Specific Objective 1: To use a tool to pick up and release small objects.

Materials

Objects that must be squeezed or otherwise manipulated to open and close them, such as clothespins, kitchen tongs, wooden toast tongs, clips, hair clips, tweezers, etc. Make a fishing rod from a piece of $\frac{1}{4}$" wooden dowel. Attach a string to the dowel and a magnet to the string. A box of a variety of small objects found in the classroom, such as pegs, beads, blocks, pencils, chalk, erasers, paper clips, paper fasteners, safety pins, hair pins, keys, screws and the like.



Activities

Before asking the child to pick up objects make certain that he is able to manipulate them.
If the child has not developed strength in the small muscles of his hand have him do some of the activities under Sensory-Motor Integration, G.O. I, S.O. 2.

1. Pick up any object from the box, using a tool, and release it into another box.
   Vary the types of tools used and the objects picked up.

2. Hold the fishing rod. Move it so that the magnet comes close to an object. Investigate which objects the magnet will attract and which it will not.

Specific Objective 2: To use a tool to pick up, place and release small objects.

Materials

Objects that must be squeezed or otherwise manipulated to open and close them, such as clothespins, kitchen tongs, wooden toast tongs, clamps, hair pins, tweezers, etc.
Small receptacles, such as jars, pegboard, milk cartons.
A variety of small objects, such as pegs, paper clips, erasers, blocks, beads, etc.

Activities

1. Pick up an object with an instrument and place the object in a receptacle.
   Vary the objects to be picked up and the containers into which the child must release the object.
   Place pegs in a pegboard. Begin by using large pegs. When the child is able to pick up and place the large pegs, have him do the activity with standard-sized pegs.
   Place beads in a small-mouth bottle.
   Place blocks in a carton.
   Pick up a pencil and place it in a bottle.

General Objective V: To develop the ability to sustain a rhythmical movement. Many children have difficulty in sustaining a rhythmical movement. The aim of the following objectives and activities is the development of the ability to perform and act repeatedly with smooth rather than erratic or jerky actions. The easiest level is where both arms work together in the same manner (S.O. 1). The next level is where one arm works alone (S.O. 2). The most difficult level is where both arms work together but are performing different actions (S.O. 3).

Specific Objective 1: To develop the ability to sustain a rhythmical movement using both arms in the same manner--

a. move both arms back and forth using the whole arm;

b. move both arms up and down using the whole arm;

c. move the forearms up and down.

Materials

Any instrument which can be held with both hands and moved back and forth, such as a rolling pin.
Material which can be rolled out, such as clay or dough.

Activities

1. (For S.O. 1a)
Hold the rolling pin with both hands.
Roll it back and forth on a flat surface.
If the child is unable to sustain this motion, stand in back of him, place your hands over his and guide his arms in making the back-and-forth motion.

2. (For S.O. 1a)
Roll out a piece of play dough or clay.
Cut out shapes with cookie cutters.

Materials

Hand pump and inflatable material, such as balloons, beach balls, punch toys, etc.

Activities

3. (For S.O. 1b)
   Attach the pump to the inflatable object. Allow several children to take turns using the pump until the object is completely inflated.

Note: Polaroid photographs of this process may be taken and used as part of Conceptualization, G.O. V.

Photo 1 - Deflated object, child holding pump.
Photo 2 - Deflated object, attached to pump, child getting ready to work pump.
Photo 3 - Partially inflated object, child in act of pumping.
Photo 4 - Fully inflated object, pump detached.

Materials

Drum and drum sticks, or rhythm block and sticks.

Activities

4. (For S.O. 1c)
Hit the surface of a drum or box with the fingertips of both hands, making certain that both hands hit the surface simultaneously.
Tap out a rhythmical pattern, for example, 3 taps in succession and a rest, repeat.
Other children should repeat this pattern after watching and/or listening.

5. (For S.O. 1c)
Hold one drum or rhythm stick in each hand.
Beat the drum or block, making both sticks touch the surface of the drum or block at the same time.
The child should be able to make a fluid up-and-down motion 8 to 10 times consecutively.

Specific Objective 2: To develop the ability to sustain a rhythmical movement using the arm--

a. move the whole arm back and forth;

b. move the whole arm up and down;

c. make a continuous circular movement of the whole arm to describe a circle in a horizontal plane

    1. clockwise

    2. counter-clockwise;

d. make a continuous circular movement of the whole arm to describe a circle in a vertical plane:

    1. clockwise

    2. counter-clockwise;

e. make a smooth movement diagonally across the body with the whole arm;

f. make a continuous up-and-down movement of the forearm;

g. make a continuous up-and-down movement of the finger;

h. make a continuous circular movement of the forearm.

Materials

Tools which may be moved back and forth with one hand, such as a paint roller, hand saw or "Whirla."

Activities

1. (For S.O. 2a)
   Roll tempera paint back and forth on a large piece of paper.
   When this a dry, paint over it or paste decorations on it.

2. (For S.O. 2a)
   Move the "Whirla" back and forth to keep the ball rolling within the wire wheel.

3. (For S.O. 2a)
   Secure a piece of soft wood (pine) or thick cardboard in a vise.
   Saw the cardboard or wood into pieces with a hand saw.

Materials

Tools that can be held in one hand and moved up and down, such as a potato masher or nut chopper.
To use the potato masher to make soap suds you will also need: bowl, soap flakes, food coloring.
To use the nut chopper you will need nuts.

Activities

4. (For S.O. 2b)
   Make soap suds by moving the potato masher up and down in a bowl of soap flakes and water.
   Color the soap flakes with a few drops of food coloring.

5. (For S.O. 2b)
   Shell walnuts.
   Place them in the chopper.
   Let the children take turns moving the chopper up and down.
   Eat the chopped walnuts.
   Try this activity with other nuts that the children can shell, chop and taste: peanuts, almonds, pecans, etc.

Note: This sequence can also be photographed and used as part of Conceptualization, G.O. V.

Photo 1 - Whole nuts in shell.
Photo 2 - Shelled whole nuts next to shells.
Photo 3 - Shelled nuts in a nut chopper.
Photo 4 - Child working nut chopper.
Photo 5 - The finished product: a pile of chopped nuts.
Photo 6 - Children eating chopped nuts.

Materials

Objects that require the child to move the whole arm in a circle, such as a lasso, food mill.
To describe large circles on paper you will also need crayons and large sheets of paper.

Activities

6. (For S.O. 2c)
Kneel or sit in front of a large sheet of paper, crayon in hand.
Make several overlapping circles on the paper using the whole arm to describe the circles.

7. (For S.O. 2c)
Twirl a lasso using a circular motion of the arm. The lasso should be perpendicular to the ground.

8. (For S.O. 2c)
Make apple sauce by having several children take turns turning the handle of the food mill.

Note: Polaroid photographs of this process may be taken and used as part of Conceptualization, G.O. V.

Photo 1 - Teacher cutting apple.
Photo 2 - Apples cooking.
Photo 3 - Cooked apples in food mill.
Photo 4 - Child turning handle of food mill.
Photo 5 - Applesauce in bowl under food mill (use a glass bowl).
Photo 6 - Children eating applesauce.

Materials

Chalkboard and chalk.

Activities

9. (For S.O. 2d)
Stand close to and facing the chalkboard.
Hold a piece of chalk in the preferred hand.
Make overlapping clockwise circles on the board using the whole arm.
When the child is able to make several large overlapping circles have him do the same activity with the other hand.

10. (For S.O. 2d)
Follow the instructions for Activity #9 above.
Make counter-clockwise circles first with the preferred hand, later with the non-preferred hand.
The diameter of the circles should be approximately the length of the child's outstretched arm.

For further instructions in making chalkboard circles, see Newell Kephart's The Slow Learner in the Classroom, pp. 139-145, The Purdue Perceptual-Motor Survey by Eugene Roach and Newell Kephart, pp. 47-53, and Ray Barsch's Enriching Perception and Cognition, pp. 260-284.

Materials

A punching bag or inflated punch toy.

Activities

11. (For S.O. 2e)
Stand in front of the target and far enough away from it so that an extended arm just reaches it. With the clenched fist of the preferred arm, hit the target.
Repeat the action several times in succession.
For strengthening of muscles on both sides of the body and the development of coordination, have the child do the same activity with his non-preferred arm.

12. (For S.O. 2e)
When the child is proficient at hitting the target, have him aim at a specific point on the target (the nose, a button), hitting it several times in succession at that one point.

Materials

Wooden or rubber mallet, hammer, drum stick or toy that allows the child to hit a target several times in succession.
For hammering you will also need soft wood boards, heavy cardboard or composition board and nails.

Activities

13. (For S.O. 2f)
Using one drum stick, beat a drum several times trying to maintain a steady beat.
The child will kinesthetically feel the steady rhythmical beat and you will be able to see and hear whether he has accomplished the objective of the activity.

14. (For S.O. 2f)
Stand the nails upright in a board by pushing them in slightly.
Hammer the nails all the way into the board with several consecutive strokes.

Materials

Any instrument that can be manipulated with one finger, such as a typewriter, piano or telegraph key.

Activities

15. (For S.O. 2g)
    Make successive taps on a key with a finger of the preferred hand.
    Perform the same activity with a finger of the non-preferred hand.
    This activity can be done with all fingers and the thumb.

Materials

Any instrument that can be manipulated with a circular movement of the forearm, such as a Halloween noisemaker, meat or vegetable grinder.

Activities

16. (For S.O. 2h)
    Secure the grinder to a table top.
    Make a continuous circular movement of the forearm holding the handle of the grinder.
    Allow the children to take turns turning the grinder.
    Motivation for this activity might be provided by a class project to grind some food.
    You might grind meat to make hamburgers, eggs for egg salad.

Note: This sequence of activities can also be photographed and used as part of Conceptualization, G.O. V.

Photo 1 - Whole egg and grinder.
Photo 2 - Child placing egg in grinder.
Photo 3 - Child turning handle of grinder.
Photo 4 - Ground egg coming out of grinder.
Photo 5 - Bowl of ground egg, child adding mayonnaise.
Photo 6 - Children eating the egg salad.

Although you might try this activity with 4- or 5-year olds use only three or four photographs to represent the sequence.

17. (For S.O. 2h)
Twirl the noisemaker with a circular movement of the forearm. The child will probably use his preferred hand. When he is successful in making the noisemaker go around ask him to try the same activity with the non-preferred hand.

Specific Objective 3: To develop the ability to sustain a rhythmical movement with integrated use of both arms--

a. move the hands back and forth in a continuous movement;

b. make a continuous up-and-down movement of the forearm while holding a tool and aiming at an object;

c. make a continuous circular movement of both arms simultaneously to describe a circle in a vertical plane

  1. clockwise

  2. counter-clockwise

  3. counter to one another;

d. make a movement of the whole arm across the body, alternating left and right;

e. make a twisting motion of the wrist with a tool aiming at a target

  1. clockwise

  2. counter-clockwise;

f. make a continuous circular movement with a tool held perpendicular to the body;

g. make a continuous circular movement with a tool held diagonally to the body.

Materials

Objects that can be rubbed back and forth between the palms of the hands, such as soap, a wooden dowel, a pencil, crayon or clay.

Activities

1. (For S.O. 3a)
   Keeping the palms flat and facing one another, rub the hands back and forth.
   Introduce this activity while the children are washing their hands and they have soap on their palms. The back-and-forth action will make a small amount of soap suds. The soap will make the activity easier by making the hands slippery thus reducing the friction between the palms.

2. (For S.O. 3a)
   Do the same activity as in Activity #1 above with the hands dry. Can the children do it rapidly for about 10 seconds?

3. (For S.O. 3a)
   Holding a thin round object (pencil, crayon, piece of wood dowel) between the palms, rub the hands back and forth without dropping the object.

4. (For S.O. 3a)
   Using a piece of soft clay placed between the palms, rub the hands back and forth to make a "snake."

Materials

Wooden mallet, hammer, "One-Two", or other toy that allows the child to make an up-and-down movement of the forearm.
For hammering you will also need nails, wooden clothespins, golf tees and wood, composition board or heavy cardboard.

5. (For S.O. 3b)
   Hang up "One-Two" so that it hangs freely.
   Have the child sit in front of "One-Two" on the floor.
   Demonstrate by pulling alternately on the left string and the right string.
   Have the child do this activity.
   If "One-Two" is placed in a permanent location children can do this activity on their own.

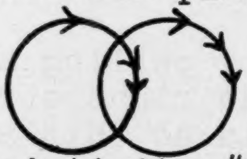
6. (For S.O. 3b)
   Hold a nail in one hand and the mallet in the other.
   Hit the nail several times with the mallet driving it into the styrofoam, cardboard or wood. (The styrofoam and cardboard will offer the least resistance and should be used at first with children who have little muscular strength.)

Materials

Chalkboard and chalk.

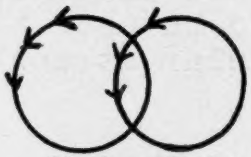
Activities

7. (For S.O. 3c)
Stand close to the chalkboard, facing it.
Hold a piece of chalk in each hand.
Make overlapping circles moving both arms in a clockwise direction.
Start both circles in the same place, for example, at the top.



8. (For S.O. 3c)
Do the same activity as Activity #7 above but the movement of the arms is in a counter-clockwise direction.

9. (For S.O. 3c)
Do the same activity as Activity #7 above but one arm moves in a clockwise direction and the other in a counter-clockwise direction.



Materials

Punching bag or inflated punching toy.

Activity

10. (For S.O. 3d)
Stand in front of the punching bag or toy.
Using one arm at a time and alternating arms, hit the target. The movements should be made smoothly without jerkiness or hesitation.

Materials

Any tool that requires the child to twist his wrist, such as a screwdriver.
You will also need screws and a softwood board with pre-drilled holes.

Activities

11. (For S.O. 3e)
    Hold the screwdriver in one hand, and the screw, placed in a pre-drilled hole, in the other hand.
    Insert the tip of the screwdriver into the slit in the head of the screw.
    Twist the screwdriver clockwise, exerting downward pressure while holding the screw. With very little pressure the screw will enter the board.
    Try to make several turns of the screwdriver without having the screwdriver slip out of the head of the screw.
    If the child has difficulty in keeping the screwdriver from slipping out of the groove in the screw head, place a small amount of clay in the groove to hold the screwdriver in place.

12. (For S.O. 3e)
    To remove a screw, turn the screwdriver counter-clockwise without exerting any pressure.

Materials

Any instrument that can be manipulated with a circular movement of the forearm, such as a hand drill or egg beater. For the hand drill you will need a soft wood board, for the egg beater, heavy cream or soap suds.

Activities

13. (For S.O. 3f)
Hold a hand drill perpendicular to, and resting on a block of wood.
Turn the handle of the drill.
Since a hole will be drilled even if the handle is moved slowly, this is a good activity to begin with.

14. (For S.O. 3f)
Whip heavy cream to make whipped cream.
As one child's arm tires, let other children take turns turning the egg beater.
Put a spoonful of whipped cream on a cookie for each child.

Note: This activity may be photographed and used as part of Conceptualization, G.O. V.

Photo 1 - Egg beater, ½ pt. heavy cream, bowl. (Use a dark-colored bowl so it will contrast with the cream.)
Photo 2 - Cream in bowl, child holding egg beater in a bowl.
Photo 3 - Whipped cream in the bowl.
Photo 4 - Children eating cream on cookies.

15. (For S.O. 3f)
Whip up soap flakes and a small amount of water to make soap suds.
Food coloring may be added to the mixture as part of Conceptualization, G.O. III, S.O. 6.

Materials

Any instrument that can be held at a diagonal to the body and manipulated using circular motions, such as a wire whisk. You will also need soap flakes, a bowl and water, or whipping cream and food coloring.

Activities

16. (For S.O. 3g)
Whip up soap flakes and a small amount of water to make soap suds, using a wire whisk.
Steady the bowl with one hand and whip the liquid using small circular motions with the other hand.
This activity requires quite a bit of strength and should be done with the older children.

General Objective VI: To develop an awareness of the body boundaries in relation to external objects. By the time young children come to school (age 3) most of them are well aware of where their bodies stop and objects (walls, chairs, other people) begin. The following objectives and activities are for impaired children who have not yet developed this awareness.

Specific Objective 1: To move the body in space--

a. to crawl beneath an object;

b. to crawl through an object;

c. to walk between two objects;

d. to walk beneath an object.

Materials

Classroom furniture and any physical education equipment arranged to form an obstacle course.

Activities

Set up an obstacle oourse, requesting the children to walk between, crawl under, or step over objects.

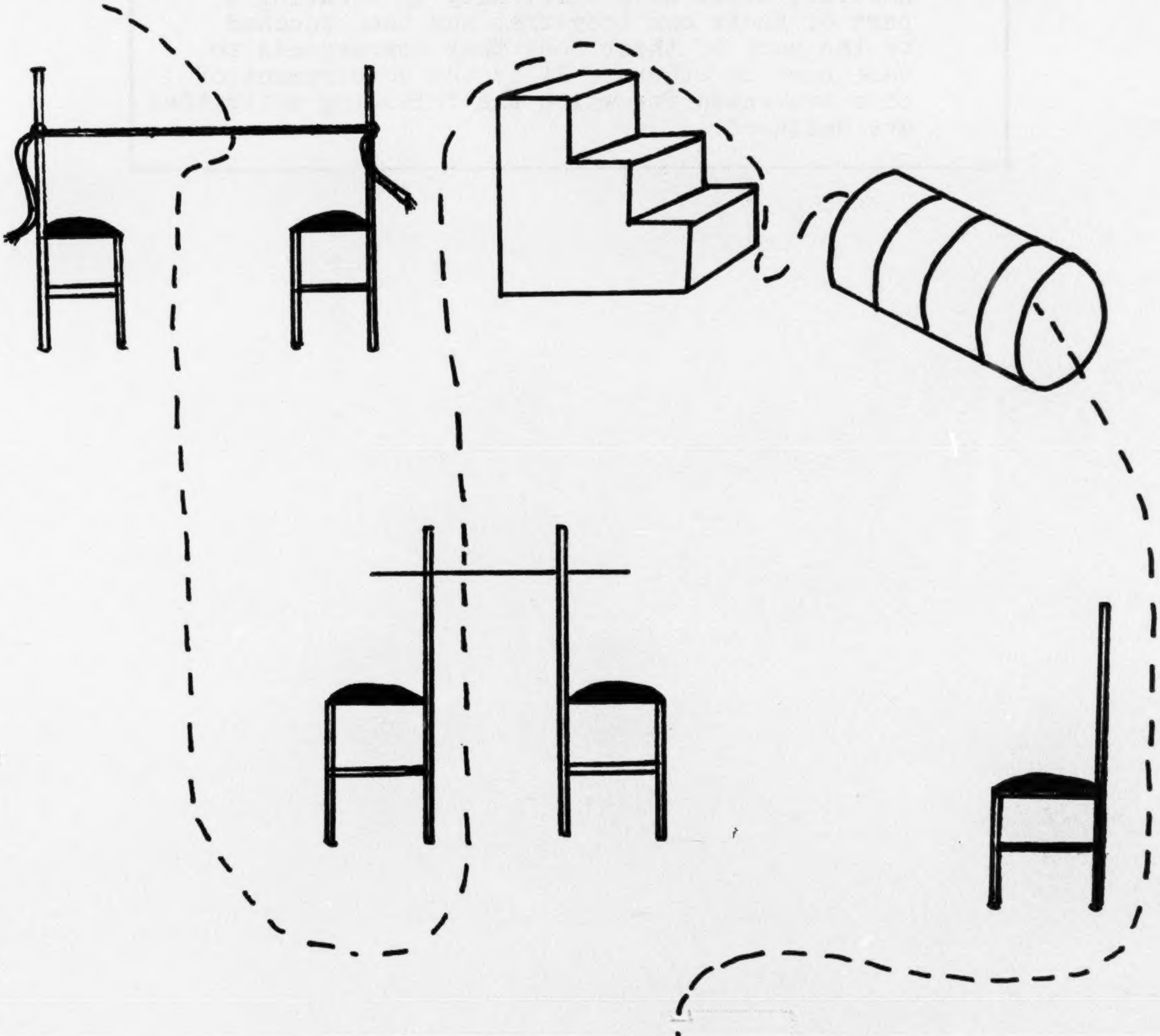
1. (For S.O. 1a)
   A rope suspended between two chairs 2 feet from the ground.

2. (For S.O. 1b)
   A packing barrel.

3. (For S.O. 1c)
   A chair placed 1½ feet from a wall.
   Two chairs placed back to back.

4. (For S.O. 1d)
   A rope suspended between two objects at a height just above the children's heads.

The route of the obstacle course may be varied to make it more challenging. As the child becomes more proficient at moving his body between two objects or beneath an object, adjust the obstacles so that the child has to bend lower or make himself thinner to go through the course successfully.



General Objective VII: To develop tactile-kinesthetic awareness of the body. Most young children have had years of practice in tactile-kinesthetic identification of body parts and are relatively competent in this activity. Some children, however, still have difficulty in locating a part of their own body that has been touched or the part of their body that corresponds to same part on others. It is the development of this awareness for which the following activities are designed.

Specific Objective 1: To develop the tactile-kinesthetic awareness of the body with tactile stimulation--

a. to develop the correspondence between parts of one's own body when tactually stimulated and the same parts of another person's body (blindfolded and with visual information);

b. to develop the correspondence between parts of one's own body when tactually stimulated and the same parts on a three-dimensional model of a body;

c. to develop the correspondence between parts of one's own body when tactually stimulated and the same parts on a picture or drawing of a body.

Materials

Three-dimensional models and two-dimensional models, pictures or drawings of children or adults.

Activities

1. (For S.O. 1a)
   Touch a part of the child's body.
   Have the child touch the corresponding part of your body.

2. (For S.O. 1a)
   Have the child close his eyes or, if he permits, blindfold him.
   Guide his hand to touch a part of his body.
   Ask him to identify by touching that same part on your body.
   In addition to touching facial features, knees, etc. don't forget places like heels, vertebrae, backs of knees, and so on.
   These are parts of the child's body that he does not see and so may be unaware of them.

3. (For S.O. 1b)
   Touch a part of the child's body.
   Have him touch a large doll in the same place that he was touched.

4. (For S.O. 1b)
   Have the child close his eyes or, if he permits, blindfold them.
   Touch a part of his body.
   Remove the blindfold.
   Have him touch a large doll in the same place that he was touched.

5. (For S.O. 1c)
   Touch a part of the child's body.
   Have him identify the part touched by pointing to the same part of the body in a two-dimensional model, picture or drawing of a child or adult.
   This activity should be done using many different pictures of children and adults to teach the concept that other children and adults have the same body parts as the child himself.

Specific Objective 2: To develop tactile-kinesthetic awareness of the body with visual stimulation--

a. to develop the correspondence between a body part on someone else and that same part on one's own body;

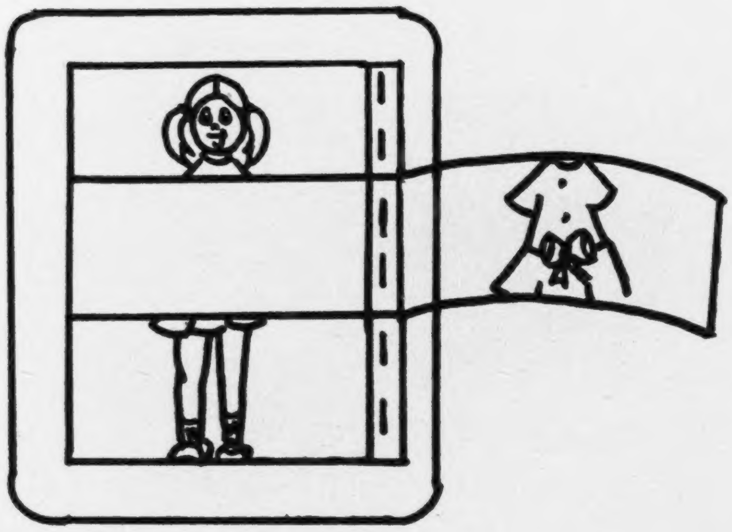
b. to develop the correspondence between a body part on a three-dimensional model of a body and that same part of one's own body;

c. to develop the correspondence between a body part on a picture or drawing of a body and that same part on one's own body;

d. to develop the correspondence between outlines or silhouettes of bodies and those body parts.

Materials

Three-dimensional models and two-dimensional models, pictures or drawings of children or adults.
Silhouettes or outlines of children in the class.
Make a set of transparency overlays of a body, having each body part on a different transparency.
In this way, you can remove by flipping away as many body parts as desired.



Activities

1. (For S.O. 2a)
   Touch a part of your body.
   Have the child touch that same part on his body.

2. (For S.O. 2b)
   Touch a part of the doll.
   Have the child touch that same part on his body.

3. (For S.O. 2c)
   Touch a part of the body on a two-dimensional model, picture or drawing.
   Have the child touch that same part on his body.

4. (For S.O. 2c)
   Using the transparency-overlays, show the children the completed body and all of its components.
   Remove a major body part.
   Have the child point to the part of his body that is missing in the picture.
   Replace the missing part to see if the child was correct.

5. (For S.O. 2d)
   Touch a section of the body on an outline or silhouette (head, hand, etc.).
   Have the child touch the same part on his body.

General Objective VIII: To develop the awareness of the spatial relationship of body parts.

Specific Objective 1: To see and identify a missing part in a three-dimensional representation of a body.

Materials

A large doll or model with detachable body parts.

Activities

1. Remove a body part from the doll.
   Ask the child to point to the area where the body part is missing.
   Have the child replace the missing part to see if he was correct.

2. Remove a body part from the doll.
   Have available a selection of detached body parts from which the child can choose the part that is missing from the doll.
   Have the child replace the part that he has chosen as the missing body part to see if he was correct.

Specific Objective 2: To see (identify) a missing part in a two-dimensional model (picture) of a body.

Materials

Two of the same magazine pictures of people. Cut up one of the pictures so that the body is cut at the joints, e.g., at the elbow, knee, ankle, etc.

Activities

1. Show the child the cut-up picture with one body part missing.
   Ask him to point to or tell you which part is missing.
   Show him the uncut picture so that he can see if he was correct in his identification of the missing part.

Note: It is important that you provide the child with a model so that he can see for himself whether he was correct or incorrect in his identification of the missing part.

Specific Objective 3: To see (identify) a missing part in a drawn representation of a body.

Materials

Drawings of people with body parts missing and transparencies of those drawings with the missing parts filled in. So that the drawings are useable with many children, you might draw them on a "Ditto."

Activities

1. Have the child point to the part of the body that is missing on the drawing.
   To see if he is correct, place a completed transparency over the incomplete drawing.
   This will enable the child to see for himself whether he was correct or not.

Specific Objective 4: To assemble a three-dimensional model of a body.

Materials

A large doll with detachable body parts.

Activities

1. Take the body parts of a doll apart.
   Put the doll together so that it is a complete figure.
   If the child has difficulty in assembling the doll, put several of the parts together and have the child place the remaining few pieces.
   Follow this procedure, allowing the child to place more missing pieces each time until he can assemble the whole doll himself.

Specific Objective 5: To assemble a two-dimensional model of a body.

Materials

Photographs of people cut up into major body parts. You may use magazine pictures or photographs of the children in your class with cuts at neck, shoulder, waist, knee, etc.

Activities

1. Put together the pieces of the body puzzle so that it makes a complete figure.
   If the child has difficulty in assembling the whole body puzzle, put the puzzle together allowing the child to place the last two or three pieces. Follow this procedure allowing the child to place more missing pieces each time until he can assemble the whole doll himself.

Specific Objective 6: To assemble pictures of individual parts of the body.

Materials

Find magazine pictures of body parts, such as hands, feet, heads, etc. Cut them up into their component parts; for example, a hand cut up into four fingers, thumb, palm or back of hand, wrist, etc.

Activities

1. Put the pictures together so that it makes a complete body part.
   If the child has difficulty in assembling the whole puzzle, put the pieces together and have him place the last two or three pieces.
   Follow this procedure allowing the child to place more missing pieces each time until he can put the whole puzzle together.

Specific Objective 7: To draw in missing parts of the body.

Materials

A series of simple line drawings of front, side and back views of bodies with parts missing.
Since it is easier to draw in small missing parts, the easiest drawings should be missing a small but noticeable body part, such as an eye, mouth, finger, knee cap, etc. The most difficult drawings might be missing a lower limb, head, torso, etc.

Activities

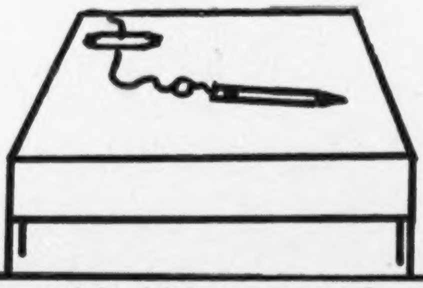
1. Begin with simple pictures, those that have small but noticeable body parts missing.
   Completing back and side views are more difficult and should only be introduced after several activities for tactile recognition of body parts on pictures (see Sensory-Motor Integration, G.O. VII, S.O. 1 and 2) have been completed.

General Objective IX: To learn to hold and manipulate broad point and fine point tools. The steps preliminary to writing are often forgotten in the haste to have the child write. It is necessary to teach the child how to hold a crayon, pencil, chalk and paint brush. If he is having difficulty in manipulating such an instrument, the teacher should provide aids and exercises to strengthen the hand, finger, and arm muscles, as all pre-writing skills require the development of muscular control for the manipulation of writing instruments. The activities for strengthening muscles may be found under Sensory-Motor Integration I through IV.

One such device often found to be helpful for children experiencing difficulty in manipulating a pencil is a small clay, sponge, or styrofoam, ball. Push a pencil through the center of the ball. When the child grasps the pencil the ball should be in the palm of the hand, thus providing support.

For those children who have poor coordination or involuntary hand movements and need to have the paper held in place, secure a piece of cloth to a desk and spray the cloth with a non-skid fluid. This will provide a non-moving writing surface.

For children who frequently drop their pencils, tape a length of material or string to the desk and secure the other end to the pencil with an eye screw.



The following activities are designed to develop the child's control over several types of writing tools, beginning with those that are easily held by small hands.

Specific Objective 1: To manipulate writing tools within large areas.

Materials

Broad-point writing tools, such as paint brushes, felt-tip pens, primary size crayons.

Note: Initially these activities are best done with the paper and child on the floor. As the child acquires more skill he can begin to work at a desk, table or easel. Because there can be little arm support, writing on a flat vertical surface like a chalk board is not recommended for children who are just beginning to write.

Activities

1. Begin with a felt-tip pen.
   The child need only exert downward pressure for the marker to work.
   First, show the child how to hold the felt-tip pen, placing his fingers if he is unable to copy the way yours are placed.
   He will have maximum control if he holds it the way an adult holds a pencil.
   Place your hand over his and guide it to make a mark on the paper.
   Remove your hand and allow the child to experiment with the pen on paper.

2. When he is comfortable using the felt-tip pen, introduce a crayon.
   Once again, remind him how to hold the crayon and again place your hand over his, guiding it to make a mark on the paper.
   He will have to press harder with the crayon than with the felt-tip pen to make a mark.

3. A broad-tip paint brush should be held in the same way a crayon is held for maximum control.
   Children enjoy painting with a broad-tip brush, as the white space is rapidly filled with color, with a minimum of effort.

Allow children to experience painting first with one color. Later, you may allow them to paint with several colors. They must remember to keep one brush for one color of paint, changing brushes every time they want to change colors. They must also remember to wash out a brush in clean water every time they want to change colors. With these simple rules the children can avoid having a muddy brown picture.

General Objective X: To develop the ability to manipulate a tool within a template to produce an unbroken line.

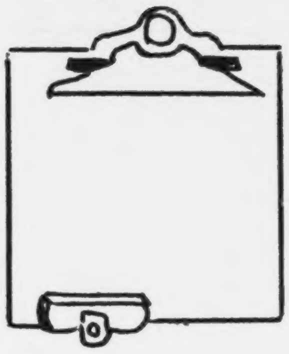
Specific Objective 1: To manipulate a tool within a template on a horizontal plane.

Materials

Template of geometric forms and of a variety of shapes. Initially, children should use templates of large simple shapes, such as a circle, oval or triangle. The greater the number of angles or number of times the child must change direction, the more difficult the task becomes. The tools used in these activities should have fine points.

Activities

To secure the paper for the child with motor involvement, place it in a clip board and secure the loose end of the paper with a clamp. Acetate sheeting and a water-soluble felt-tip pen may be used for making erasable drawings. You might also magnetize the backs of the templates and have the children work on a metal surface. This will prevent the template from sliding around on the paper.



Note: Some children (young and older) feel more secure if they are sitting on the floor. As they become more confident in using a writing tool they will want to sit at a desk or table.

1. Have the child sit on the floor in front of a large sheet of paper.
   If you have rugs make sure he can lean on a hard surface.
   Hold a circle template on the paper.
   With the child holding a felt-tip pen or crayon place your hand over his and guide his hand around the template, moving counter-clockwise.

Note: In both manuscript and cursive writing, circular letters are made with counter-clockwise movements.

2. When the child can draw an unbroken figure using the template, having you hold the template, allow him to do this activity himself.
   If he is sitting on the floor,the template can be steadied by putting a knee or leg across it.
   If he is sitting at a table, he can put a hand, elbow, or arm on the template.
   Save the best drawings for use in Sensory-Motor Integration, G.O. XI, S.O. 1 and 2, filling in large areas.

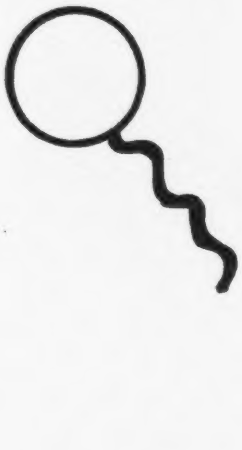
3. When the child is able to draw an unbroken figure (a "good" circle, a "good" square) introduce small templates.
   Once again, if a child feels more secure, allow him to do this activity on the floor.
   At first, you may have to hold the edges of the template.
   If the child needs an intermediary step between your holding the template and his holding it by himself, clamp the template to a clipboard.
   He will then be able to work independently.

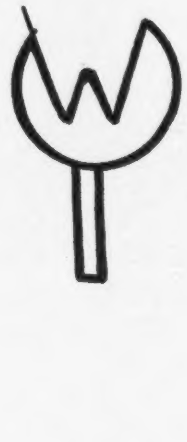
General Objective XI: To develop the ability to manipulate a tool to fill in a designated area.

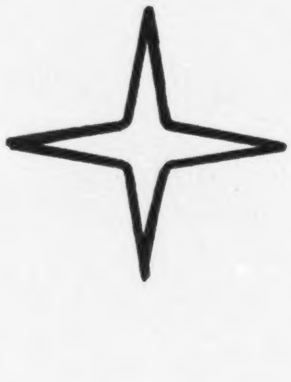
Specific Objective 1: To fill in a large area with broad boundaries.

Materials

Large, simple line drawings. The drawings should have thick boundaries. If you are using pre-printed drawings, make the lines thick by going over them with a broad-point, black felt-tip pen.







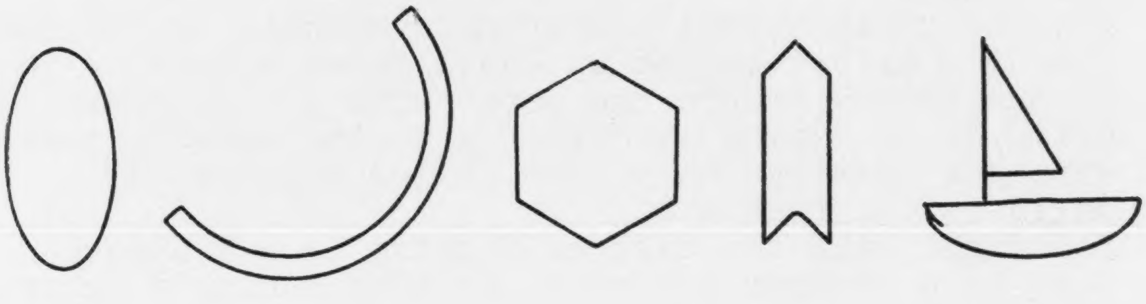
Activities

1. Using paint and paint brush or broad-point felt-tip pen, draw the outline of a large, simple figure.
   Make the outline very broad so that children who are just learning to control a brush or pen won't be able to go outside of the lines easily.
   Ask the child to color in the figure, staying within the lines.
   The child might feel comfortable working on the floor, standing or sitting at an easel, or at a desk or table.
   If necessary, secure the paper with a clip board and clamp, or by taping it directly on the working surface.
   When the drawings have been filled in, have the children cut them out.
   You might make the task of filling in a boundary part of a broader activity, such as making a paper puppet, a collage, etc.

Specific Objective 2: To fill in a small area with narrow boundaries.

Materials

Line drawings of geometric or simple figures.



Activities

1. Using a fine-point felt-tip pen or a crayon, draw the outline of a simple figure on standard size paper ($8\frac{1}{2}$x11).
   Ask the child to color in the figure, staying within the lines.

2. Color within figures drawn by the child with various templates.
   If necessary, secure the paper with a clipboard and clamp, or tape it directly on the working surface.

General Objective XII: To develop the ability to manipulate a tool to draw a line between two lines.

Specific Objective 1: To draw between lines 1" apart--

a. to draw between vertical lines;

b. to draw between horizontal lines;

c. to draw between curved lines;

d. to draw between the lines of a maze.

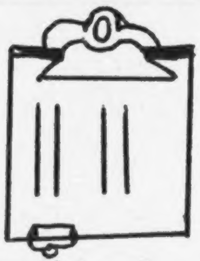
Materials

A series of parallel and curved lines 1" apart.
Use a water-soluble felt-tip pen and a pencil as writing tools.
For children who need the additional support of the kinesthetic sense in writing, use non-hardening clay rolled thin, and placed in a shallow box top.
Stretch two parallel strings 1" apart, across the clay.
An orange-stick or stylus can be used to draw in the clay.

Activities

1. (For S.O. 1a)
Have the child draw a line in the rolled clay between the two strings with an orange-stick or stylus.

2. (For S.O. 1a)
Place a sheet with drawn or printed parallel lines under the acetate.

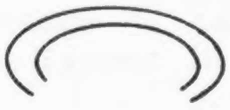


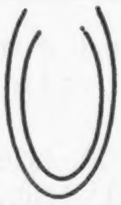
Hold the paper so the lines are vertical. Using a water-soluble pen, demonstrate by drawing a line in-between the two guide-lines. (The ink is water soluble and can be removed with a damp sponge or cloth.) When the child is successful in staying within the lines, give him a pencil, remove the sheet from under the acetate, and let him do the activity directly on the paper.

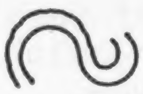
3. (For S.O. 1b)
Follow the same procedure as in Activity #1 above, but turn the paper around so that the lines are horizontal.

Note: Be sure that the child draws his lines from left to right in preparation for reading and writing.

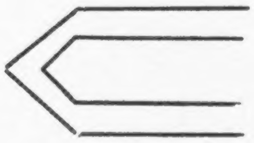
4. (For S.O. 1c)
Follow the same procedure as in Activity #1 above, but use curved lines.

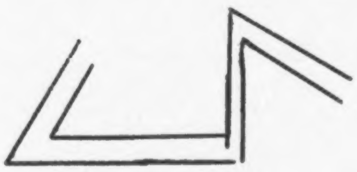


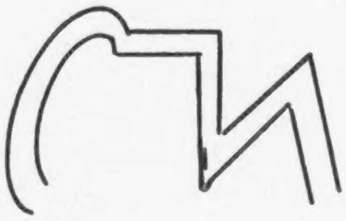




5. (For S.O. 1d)
Follow the same procedure as in Activity #1 above, but use parallel lines where the child must change the direction of his line many times.







Specific Objective 2: To draw between lines $\frac{1}{2}$" apart--

a. to draw between vertical lines;

b. to draw between horizontal lines;

c. to draw between curved lines;

d. to draw between the lines of a maze.

Materials

A series of parallel, straight and curved, lines $\frac{1}{2}$" apart. Use a water-soluble felt-tip pen or a pencil as a writing tool.

Activities

1. The lines on these materials should be $\frac{1}{2}$" apart, and so they are more difficult than the activities in S.O. 1 on the preceding page.
   Use a variety of these materials with children who have difficulty in motor control.
   When the child is able to draw a line between two lines $\frac{1}{2}$" apart without touching the guide lines, go to the activities that follow under S.O. 3 on the next page.
   If the child has difficulty in staying within the lines, and you feel that he needs additional kinesthetic support, follow the activity described under S.O. 1, Activity #1, writing in clay.

Specific Objective 3: To draw between lines $\frac{1}{4}$" apart--

a. to draw between vertical lines;

b. to draw between horizontal lines;

c. to draw between curved lines;

d. to draw between the lines of a maze.

Materials

A series of parallel, straight and curved, lines $\frac{1}{4}$" apart. Use a water soluble felt-tip pen or a pencil as a writing tool.

Activities

1. The lines on these materials should be $\frac{1}{4}$" apart.
   Follow the same procedure as in S.O. 2, Activity #1 above.
   First use the acetate report holder, as this permits the child to repeat the same activity several times.
   When the child is able to succeed at this task, give him the activity pages themselves to draw on.
   If he is successful, he will have a lasting record of his success.
   His failures, if marked with the water-soluble pen on the acetate, won't serve as reminders of failure.

General Objective XIII: To develop the ability to draw a line between two points to connect them. In order to master the following activities the child must--

(1) visually focus without distraction;

(2) move the writing tool in a straight line without wavering for an increasingly longer distance. In mastering the tasks he will be able to make accurate small downward, horizontal and diagonal strokes with a writing tool, the same basic strokes that he will be making when he writes letters and numbers.

Specific Objective 1: To draw a line connecting two points that are 1" or less apart--

a. from top to bottom;

b. from left to right;

c. diagonally from top left to bottom right;

d. diagonally from top right to bottom left;

e. with intersecting lines.

Materials

A series of points with the two points 1" or less apart. The points should be on a vertical plane, horizontal plane, and on diagonals.
As an additional aid, color the point GREEN at which the child is to begin his line, and color the termination point RED.
Pencil or felt-tip pen.

Activities

1. (For S.O. 1a)
   For young children or for children who have difficulty in controlling impulsive behavior, begin by teaching the child that GREEN means go and RED means stop.
   This can be accomplished by providing examples, making gestures and saying the words "STOP" and "GO."
   Demonstrate by drawing a line from a green mark to a red mark.
   Guide the child's hand to draw a straight line down from a green to a red mark.
   When the child grasps the idea of connecting the green mark to the red mark, have him connect the two points.
   Make the green and red marks in the appropriate places on a few sets of dots.
   Continue to make the colored marks for as long as the child needs those additional guides.

2. (For S.O. 1b)
When the child is able to connect points that are 1" or less apart with a vertical line, have him connect them with a horizontal line.
Provide the colored marks again if necessary.

Specific Objective 2: To draw a line connecting two points that are more than 1" apart--

a. from top to bottom;

b. from left to right;

c. diagonally from top left to bottom right;

d. diagonally from top right to bottom left;

e. with intersecting lines.

Materials

A series of points where the points are more than 1" apart. The points should be on a vertical, on a horizontal, and on diagonals.
Pencil or felt-tip pen.

Activities

1. (For S.O. 2a)
   Connect two points with a vertical line.
   Continue to use the red and green markers if the child needs them as guides.

2. (For S.O. 2b)
   Follow the instructions as in Activity #1 above, drawing a horizontal line to connect the two points.

3. (For S.O. 2c and 2d)
   Follow the instructions as in Activity #1 above, drawing diagonal lines.

4. (For S.O. 2e)
   Follow the instructions as in Activity #1 above, drawing intersecting lines.

General Objective XIV: To develop the ability to manipulate a tool around the outside of a template to produce an unbroken line.

Specific Objective 1: To manipulate a tool around the outside of a circular template.

Materials

Any circular shapes found in the classroom, such as jar lids, coffee cans, blocks and a pencil or fine-point felt-tip pen to draw around the shapes.
As an additional kinesthetic aid, embed the shape in a flat piece of non-hardening clay.
Use a stylus or orange-stick to draw in the clay.

Activities

1. Embed the circle in a piece of non-hardening clay. Have the child draw around the shape with an orange-stick or stylus.

2. Place a circular shape on a piece of paper.
   Demonstrate by holding the shape with one hand and tracing around it with the other.
   While you steady the shape, have the child draw a line around it.
   Point out that if the drawing is done well, the shape itself will fit into the drawing.

3. Have the child hold the shape himself and trace around it.
   Have him trace around the same shape several times in different places on the same piece of paper.
   Save the drawing for use in Sensory-Motor Integration, G.O. XV, S.O. 1 and 2, tracing a previously drawn line, or G.O. III, S.O. 3, cutting out simple drawings using scissors.

Specific Objective 2: To manipulate a tool around a template with many sides.

Materials

Several many-sided shapes found in the classroom, such as blocks, books, box tops, book-ends, erasers, puzzle pieces.
Use a pencil or fine-point felt-tip pen to draw around the shape.
For those children who need the additional kinesthetic support, embed the figure in the non-hardening clay.

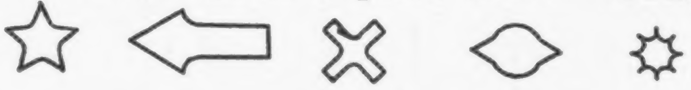
Activities

1. Follow the same procedures as S.O. 1, Activities #1 and #2 above.

General Objective XV: To develop the ability to manipulate a tool on top of (tracing) a previously drawn line.

Specific Objective 1: To manipulate a tool over a simple shape or picture.

Materials

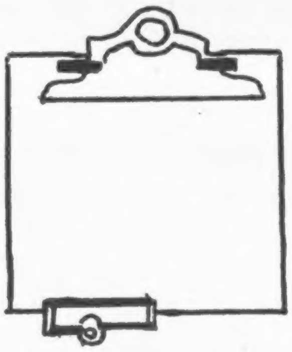
Simple shapes drawn on paper with a pale color broad point felt-tip pen, e.g., 

Use a clip board and clamp to anchor the paper.
Use acetate sheets to provide an easily erasable writing surface.

Activities

1. Place the drawings of simple samples that you have made under a sheet of acetate.
   Have the child trace over that drawing with a dark-colored, fine-point, felt-tip pen.
   He can readily see how accurately he made his drawing.

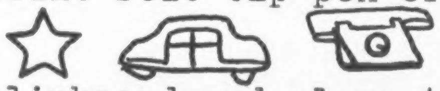
2. Place your drawing under a sheet of tracing paper. Clip the two together on a clipboard and secure the bottom of the sheet with a clamp. This will hold both sheets firmly.
   With a felt-tip pen there is less chance of tearing the tracing paper than with a pencil.



When the child is able to make his pen line stay within the lines of the picture you have drawn, go to the next activity. If he needs more work in this area be sure to vary the drawings you give him to trace to keep him motivated.

Specific Objective 2: To manipulate a tool over a complex shape or figure.

Materials

Complex shapes drawn on paper with a pale-colored broad point felt-tip pen or magazine pictures
e.g., 

Use a clipboard and clamp to anchor the paper.
Use acetate sheets to provide an easily erasable writing surface.
A felt-tip pen or pencil.

Activities

1. Place the complex drawings you have made with a broad point felt-tip pen under acetate. If necessary, clip to a clipboard and secure with a clamp.
   Have the child trace over them with a grease crayon or water soluble felt-tip pen.

2. Place a drawing you have made under tracing paper.
   Clip to a clipboard and secure the end with a clamp.
   Have the child trace over the drawing.

3. Place a page from a magazine under a sheet of tracing paper or acetate.
   Secure the papers.
   Have the child trace the picture.

Specific Objective 3: To manipulate a tool over symbols (alphabet letters and numbers).

Materials

Any recessed letters or numbers and a crayon or pencil for use in making the symbols.
Any clearly printed symbols.

Activities

1. Place a crayon or pencil in the groove of a letter or number.
   Begin with the letters and numbers that are easy to make, e.g., l, i, t, F, 7.
   Guide the child's hand in making the letters or numbers. This action will reinforce the feeling of making this symbol with a writing tool.

2. Have the child trace over printed symbols.
   Begin with large letters and numbers that are clearly printed.

General Objective XVI: To develop the ability to reproduce drawings and symbols from a model. The following activities are organized to help the child develop the ability to make an accurate reproduction of printed materials. It is essential that the child have extensive experience in Visual Analysis and basic Sensory-Motor Integration muscle-strengthening activities before attempting to reproduce drawings or symbols from a model.

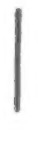
Specific Objective 1: To imitate the teacher's movements to produce a drawing, e.g., the teacher makes one line, the child copies that line, the teacher makes a connecting line, the child copies, etc.

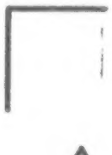
Materials

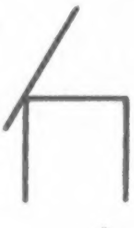
Pencils or fine-point felt-tip pens and unlined paper.

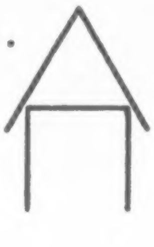
Activities

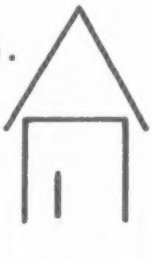
1. Sit next to the child.
   Each of you should have your own paper and pen.
   Make a line (picture #1 below).
   Have the child draw a similar line on his paper.
   Draw a line (#2 below) connected to line 1.
   Have the child copy your line 2.
   Continue in this manner, (you) drawing a line, then the child copying that line on his paper, until you have completed a picture.
   You might draw a house in these stages:

1.


2.


3.


4.


5.


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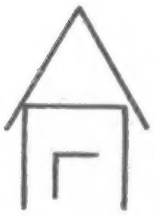
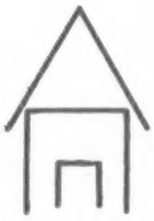
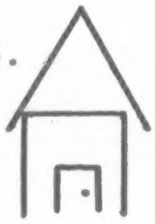
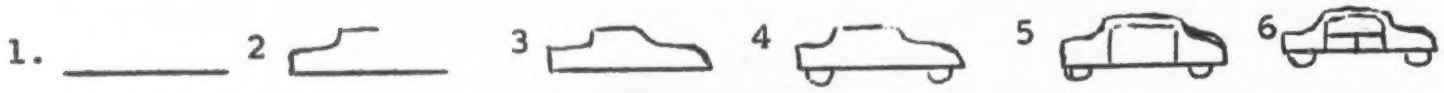


7.


8.


2. Follow the same procedures as in Activity #1 above, making 2 or 3 lines at a time.
For example, you might draw a car in these stages:



To aid motivation for the activity, encourage the child to guess what you and he are drawing, at each stage.
Reverse roles, so that the child becomes the "teacher" and draws the lines first.
To make this task easier, suggest that the child draw his figure first, and study its parts.

Note: When he plays the role of teacher he must plan ahead. He must have analyzed the final product and broken it down into its components. If he is able to do this, do you observe this ability in other areas of work?

Specific Objective 2: To copy a single printed figure--

a. to copy a simple shape;

b. to copy a complex shape;

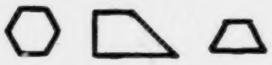
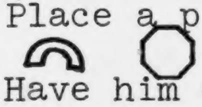
c. to copy symbols (letters and numbers).

Materials

Several printed models of simple and complex geometric forms, alphabet letters and numerals.
For additional tactile-kinesthetic aids, you might use textured or three-dimensional forms, letters or numerals.
Pencil or felt-tip pen.

Activities

1. (For S.O. 2a)
   Place a picture of a simple geometric figure (△ ○ □) in front of the child.
   Have him copy the picture while it is still in view.

2. (For S.O. 2b)
   Place a picture of a complex geometric figure ( ) in front of the child.
   Have him copy the picture while it is still in view.

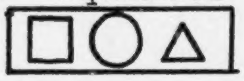
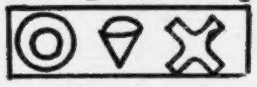
3. (For S.O. 2c)
   Place an alphabet letter or number in front of the child.
   Have him copy the letter or number while it is still in view.
   If textured or three-dimensional materials are used the child may find it useful to touch them before making his drawing.
   Eventually he must be able to copy a printed form.

Specific Objective 3: To copy a sequence of printed symbols--

a. to copy a sequence of simple figures;

b. to copy a word.

Materials

Make drawings of sequences of simple shapes and words on cards, e.g.,   cat ball

Pencil or felt-tip pen.

Activities

1. (For S.O. 3a)
   Place the model above the child's paper.
   Have the child reproduce the model.
   Have him check to see if he accurately reproduced the shapes and the spacing between the shapes.

2. (For S.O. 3a)
   Place the model to the left of the child's paper.
   Have the child reproduce the model.
   Have him check to see if he accurately reproduced the shapes and the spacing between the shapes by placing the model above his paper and comparing the two.

3. (For S.O. 3a)
   Place the model at a distance from, and in a vertical plane to, the child, on the wall or blackboard.
   Have the child reproduce the model and check to see if it is correct.

4. (For S.O. 3b)
Follow the same procedure as Activity #1 above, first using three-letter words.
Gradually increase the number of letters in the words to five or six.
To increase the child's motivation you might ask him which word he would like to write or write words that are in his sight vocabulary.

In placing the model in different places--above, to the left, or at a distance from the child--you can observe the position(s) in which he makes mistakes, and analyse the types of errors.
By doing this you will know the best positions in which to place the model so that the child will perform optimally. This will also help you define the areas in which the child needs additional instruction.

Specific Objective 4: To copy several sequences of printed symbols --

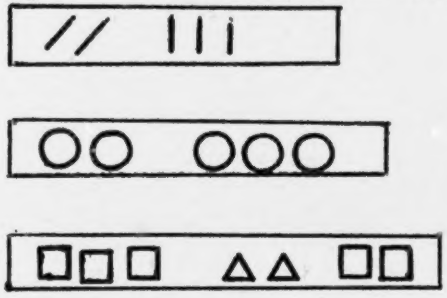
a. to copy several sequences of simple shapes;

b. to copy phrases or sentences.

One of the most important features of written material is the spacing between words. Children often ignore the spaces in reproducing words, thus making the task of reading what they have written very difficult. The following activities are designed to teach the child to attend to these necessary features. These activities should be used only after the child has mastered the activities in Visual Analysis, G.O. X, S.O. 1 and 2.

Materials

On cards make drawings of simple shapes and phrases with spaces in between them:



the boy

in a day

to the store

Pencil or felt-tip pen.

Activities

1. Place the model above the child's paper.
   Have the child reproduce the model.
   Have him check to see if he accurately reproduced the lines or figures and the spaces between them.

2. Place the model to the left of the child's paper.
   Have the child reproduce the model.
   Have him check to see if he accurately reproduced the lines or figures, and the spaces in between them, by placing the model above his reproduction and comparing the two.

3. Follow the same procedure as Activity #1 above, first using phrases and later, sentences.

4. Follow the same procedure as in Activity #2 above, first using phrases and later, sentences.

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GROSS MOTOR

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Introduction

By the time a child begins to attend school he has acquired a whole repertoire of motor behaviors that have been developing since birth. Initially the motor behavior was closely related to his cognitive development; he learned a great deal about the sensations from his own body and his physical capabilities. Experimentation with movement also led him into contact with and knowledge of the people and objects in his environment. With normal development, as the infant became stronger his repertoire of motor acts also grew and he passed predictable milestones, such as rolling over onto his stomach, sitting up, crawling, standing, and taking his first step. Each level of motor achievement provided the prerequisites for the next level.

As with the motorically developing infant, so too must a school age child have this kind of sequenced motor development before he is prepared to take pencil in hand and draw a circle. An analysis of all of the motor coordinations that a child must have before he is ready to perform this task is almost overwhelming. But it is these antecedent behaviors that have been developed through years of practice resulting in the refinement of muscular coordination.

The overall aim of the objectives that follow in the Gross Motor Coordination section is to help the child develop greater control over his body movements and to acquire an ease and efficiency in those movements. When the child is able to perform motor acts automatically, without attention to the _mechanics_, he can turn his concentration towards the _content_ of what is to be learned.

Although some of the skill objectives are specific to the development of the function of certain muscles, we must keep in mind that the end result of the motor activities is the _coordinated_ development of all muscle groups so that they _will function_ at the will of the child and his movements will be made in a smooth, controlled manner.

In attempting to achieve this goal the child will be developing strength in and control over his muscles so that they will perform a physical act when it is relayed to them from the brain. He will also be receiving kinesthetic sensations, thus aiding in the development of an awareness of his own body boundaries in relation to the objects and space around him.

For many of the tasks that the child is having difficulty or limited success in mastering, repetition, together with physical maturation, may be what is needed. To encourage the child to continue practicing the activity, find ways of varying it using either different settings or different materials. Many of the Gross Motor activities may be used in conjunction with fulfilling the educational objectives in other areas, such as Visual Analysis, Sensory Motor Integration, etc. Regardless of the area, help the child to feel that he is making some progress in mastering an activity by providing opportunities for him to be successful at some level.

The objectives and activities in this section are divided into three parts: *bilateral*, *unilateral*, and *integrated* (or *cross-lateral*). They are ordered in this way based on the observed sequence of motor development in normal infants (Barsch, 1968).

The most basic level of movement consists of moving both arms and/or legs simultaneously in the same direction. This type of movement we will call *bilateral*. Jumping with both feet together and turning a somersault are examples of bilateral gross motor movements.

At a more advanced level of motor development each side of the body is able to work independently. This type of movement can be called *unilateral*. Hopping on one foot or throwing a ball with one hand from a standing position are examples of unilateral movements of large muscle groups.

The most highly developed level of movement is called *integrated* or *cross-lateral*. It is the coordinated movement of the left and right side of the body working together to carry out a motor act. An example of integrated or cross-lateral gross motor movement is the opposition of right arm and left leg, then left arm and right leg to provide for locomotion in skipping and walking. For further discussion of the sequence of motor development we refer you to Dr. Ray Barsch, *Enriching Perception and Cognition*.

Where they were available the age levels for expected performance have been provided as guidelines to indicate in which areas children may be physically immature.

Before giving the child extensive remediation in any of the Gross Motor areas, please consider the following: a) the child's experiential background (the activities you have asked the child to perform may not be in his motoric repertoire because he has never had the opportunity to do that physical activity before); and, b) the child's physical condition

(Because of cerebral palsy, visual impairment, or other physical handicap the child may not be able to carry out the activities at the ages given. It may take a physically impaired child much longer to achieve certain motor objectives and, depending on the activity and degree of impairment, some children may never achieve them.).

Once again let us state that it is not our intention to have every child achieve every objective from crawling to walking a balance beam backwards. What is provided is a full sequence of objectives for motor development so that you the teacher can determine the status of the child's posture, body alignment, balance, use of vision as a guide, etc., as he performs different activities. Many different activities are suggested for each general objective so that the child who is inefficient or uneasy in executing a motor act can have a wide variety of experiences in feeling his body perform that act.

The very basic objectives, such as crawling and rolling, have been included because young children and often older atypical children are at a very primitive level of motor coordination. The more challenging objectives are provided for the older, more motorically coordinated youngsters.

For additional activity suggestions we refer you to the following sources which we have found to be helpful in planning a curriculum of Gross Motor activities:

Barsch, R. H. Enriching perception and cognition.

Cratty, B. Development sequences of perceptual-motor tasks.

Kephart, N. C. The slow learner in the classroom.

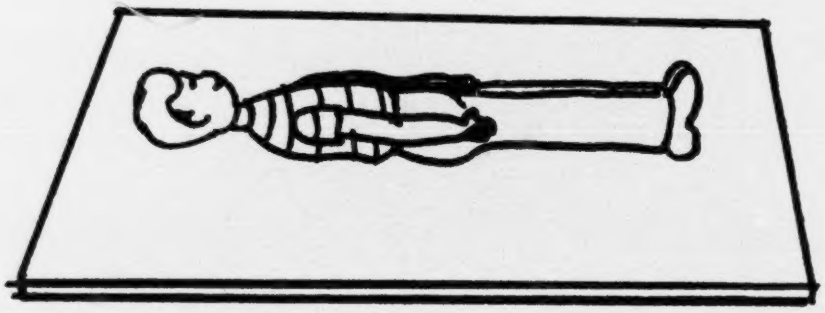
Portland Public Schools. Improving motor-perceptual skills.

General Objective I: To develop the ability to perform bilateral motor acts smoothly, with proper body alignment and control.

Specific Objective 1: To roll with the body in vertical alignment (legs straight, arms held at the side of the body) --

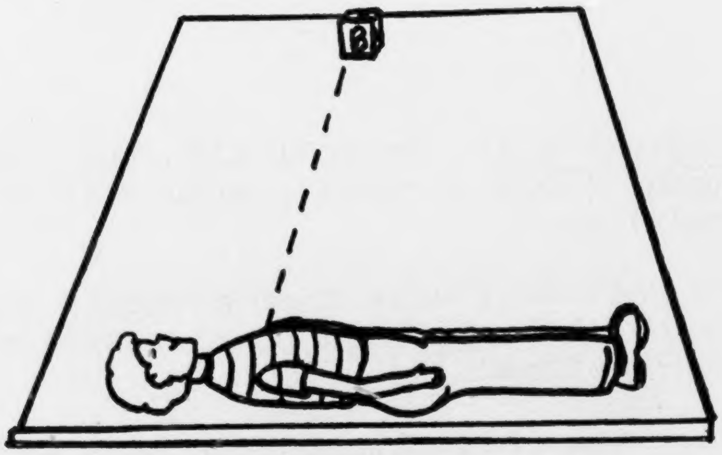
a. to roll over once from a supine position (lying on one's back) to a prone position (lying on one's stomach)

1. Have the child lie on his back on a floor mat. As a preparation for rolling, have the child lift his head from the mat and hold it up for 2 or 3 seconds, look at his feet, then replace it on the mat.
   When the child is able to do this activity easily, have him lift his head from the mat and turn it to the left or right, then replace it on the mat.



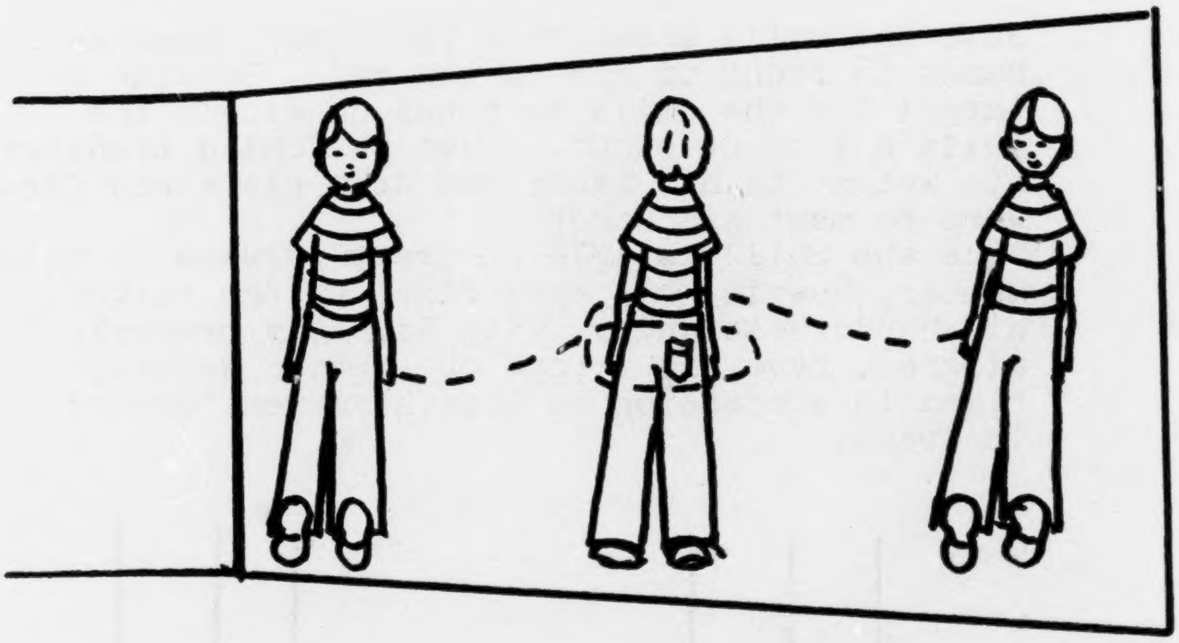
2. Place a toy or other object about 3 feet from the child's shoulder in his line of sight. Have the child roll towards the object, focussing on the target. The sequence of physical movements for the roll are as follows:
   1) raise the head;
   2) turn the head and lift one shoulder;
   3) turn the whole body;
   4) complete the roll lying on the stomach.

   Throughout the roll the child's ear should remain in a straight line with his ankle, with the hands held at the child's side and legs straight.



b. to make several consecutive rolls

When the child is able to accomplish a smooth roll maintaining his body on a vertical axis, have him do two consecutive rolls so that when he completes the last roll he is lying on his back.



c. to make several consecutive rolls while focussing on a distant target

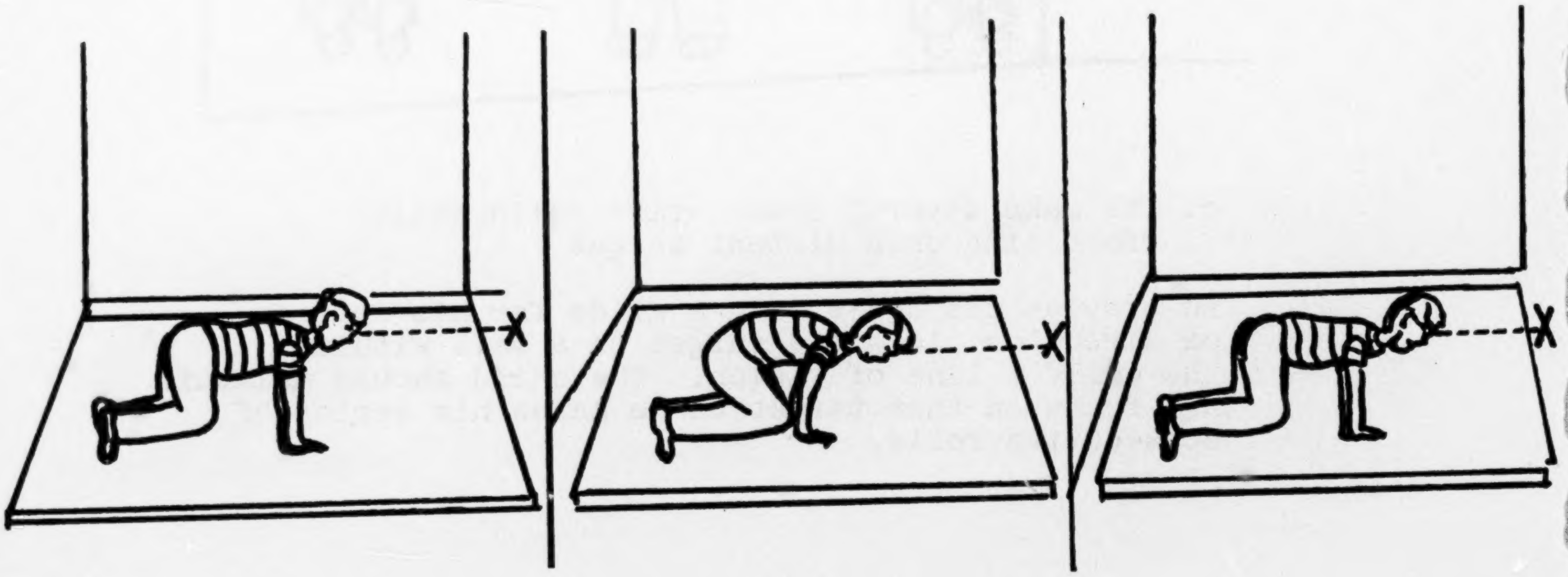
To provide the child with a guide for his course of direction, locate a target on a wall within the child's line of vision. The child should maintain his focus on that target as he makes his series of consecutive rolls.

Specific Objective 2: To crawl in a bilateral pattern (moving both arms simultaneously, then moving both legs simultaneously) --

a. to make a single forward motion

b. to crawl forward with a series of motions

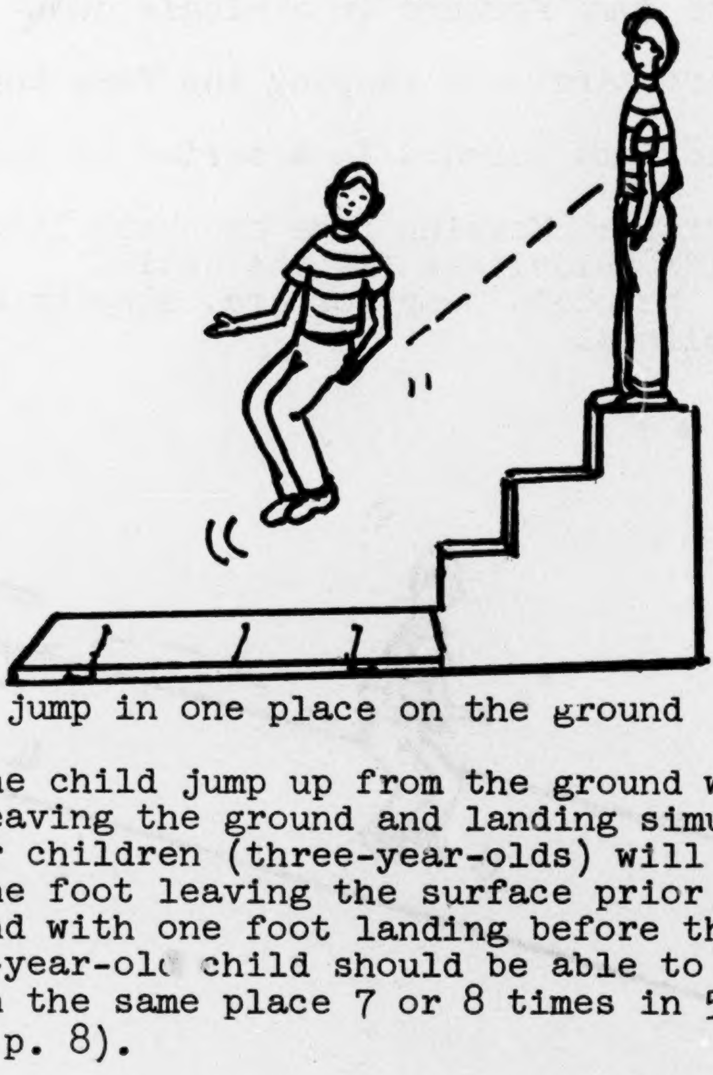
Have the child kneel on a floor mat, placing his hands in front of him on the mat. Provide a target for the child to focus on within the child's line of sight. Have the child transfer his weight to his hands and draw his knees forward to meet his hands.
Once the child is able to crawl forward in this manner, keeping his eyes fixed on the target, his hands stationary, with his body properly aligned, have him repeat the motion several times in succession so that he moves forward in space.



Specific Objective 3: To jump keeping the feet together --

a. to jump down from a height

In all of the jumping activities the child's feet should leave the surface and land at the same time. Physically immature children will probably land first on one foot, then on the other rather than landing on both feet at once.
Have the child jump down from an 8" height onto a cushioned surface, such as a floor mat, rug, etc. When the child is able to jump with both feet leaving the surface at the same time, have him jump from progressively higher heights (12", 18", 28"). If the child is unsure of himself, stand in front of him, holding his outstretched hands as he jumps from the height.



b. to jump in one place on the ground

Have the child jump up from the ground with both feet leaving the ground and landing simultaneously. Younger children (three-year-olds) will first jump with one foot leaving the surface prior to the other and land with one foot landing before the other.
A five-year-old child should be able to jump up and down in the same place 7 or 8 times in 5 seconds (Doll, p. 8).

c. to jump 10-20 times in succession on a yielding surface, e.g., on a trampoline, foam rubber, rubber tire, 3/4" plywood, jumping board

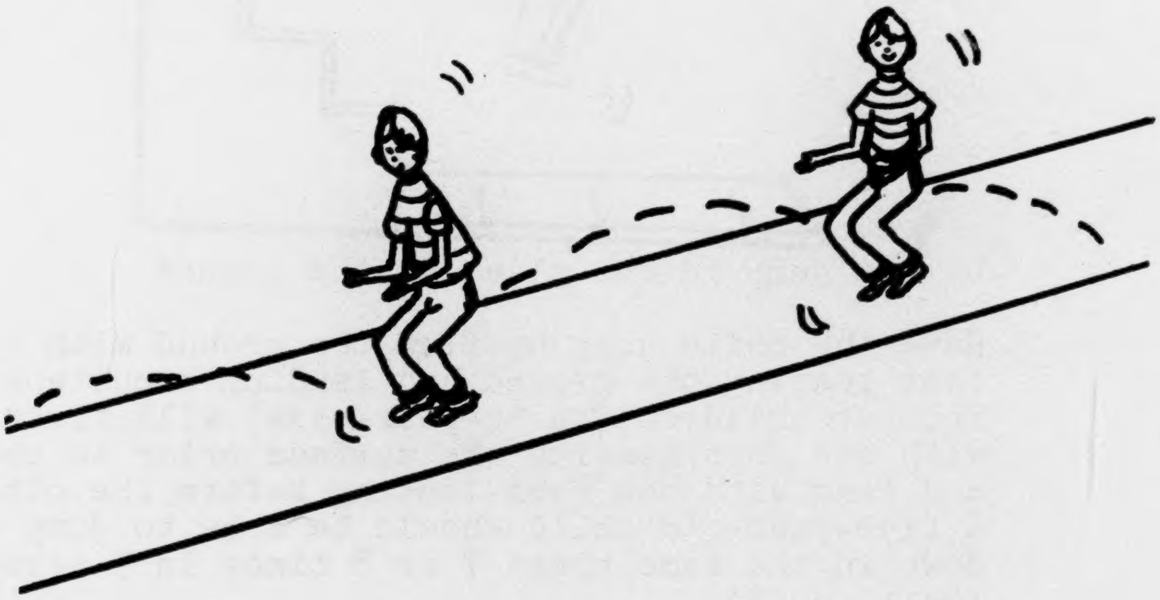
To see if the child is able to maintain proper body alignment during a balancing activity, have the child jump from 10-20 times in succession on a yielding surface.
If the child cannot maintain his balance around the vertical axis of his body it will be readily evident during this activity.
For the child who is experiencing difficulty in performing this task, stand in front of him and hold his outstretched hands until he feels able to jump by himself.

d. to jump forward in a single jump

Jump forward once keeping the feet together.

e. to jump forward in a series of jumps

Materials: Masking tape or chalk lines in patterns. Provide guidelines for the child.
Have the child jump forward, staying within the guidelines.



f. to jump over an obstacle (e.g.; jump from the outside of a hula hoop to the inside of the hoop, jump over a moving jumprope)

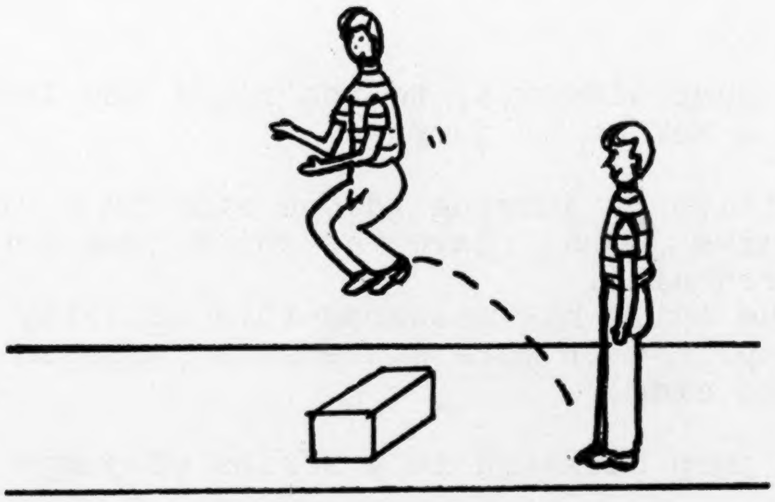
Materials: Masking tape or chalk lines on the floor, hula hoop, blocks

Have the child jump over the line or object with both feet leaving the ground and landing simultaneously.

As the child is able to jump over a low obstacle, provide him with progressively higher obstacles (hula hoop, 1 block, a tower of blocks, gently swinging jumprope).

The obstacles can be varied in height but should be chosen carefully with the safety of the child in mind.

A six-year-old child should be able to jump over a rope held 8 inches from the ground (Doll, 1946).

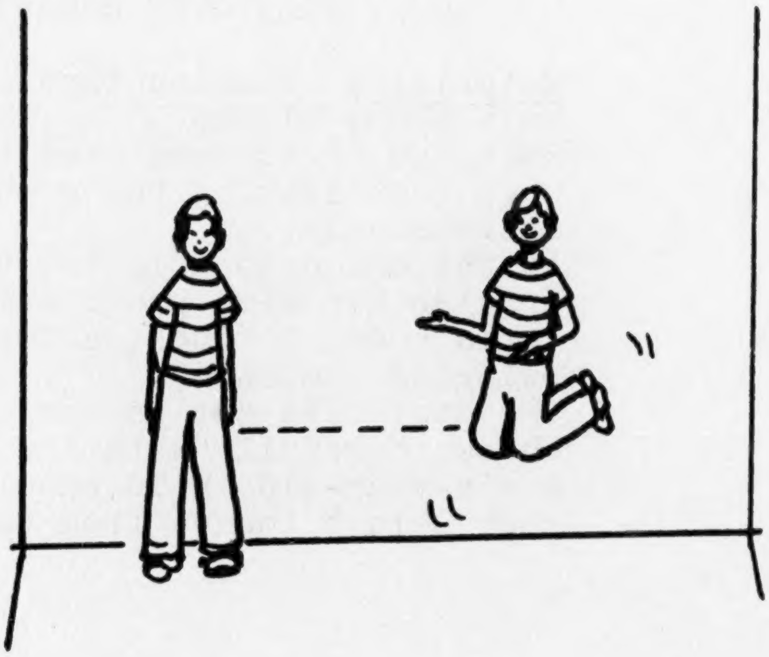


g. to jump backward in a single jump

Jump one step backwards, making sure that both feet leave the ground and land simultaneously.

h. to jump sideways once, to the right and left sides

Jump to one side keeping both feet together. When the child is able to jump to one side have him jump to the opposite side.



i. to jump sideways, to the right and left sides, in a series of jumps

Demonstrate by jumping to one side in 4 or more successive jumps. Have the child jump to his preferred side.
When the child has mastered this activity have him jump in 4 or more successive jumps to the opposite side.

j. to jump backward in a series of jumps

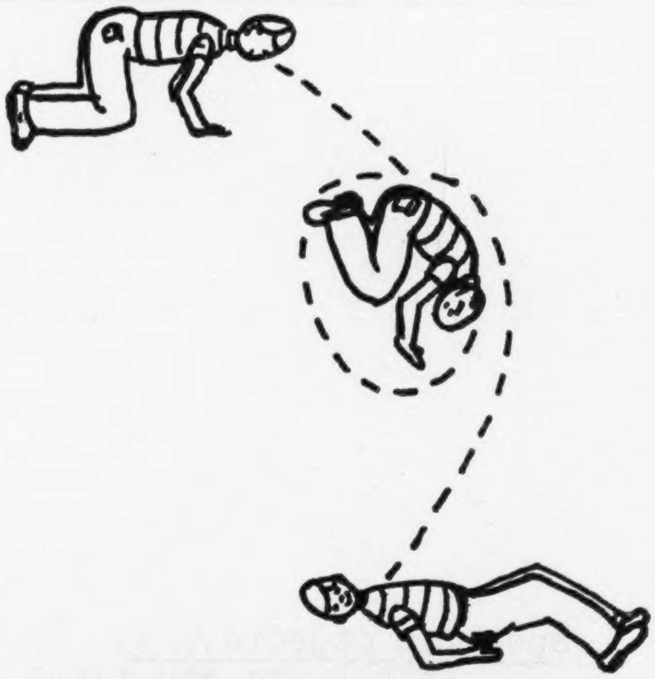
Jump backwards 4 or more times, keeping both feet together.
Provide guidelines within which the child must jump.

k. to jump sideways alternating first to the right side, then to the left side several times

Alternate jumping first to one side then to the other. To make this activity more challenging, place a line of tape or chalkline on the floor. Have the child jump sideways over the line making sure that he does not touch the line.

Specific Objective 4: To turn a somersault --

a. to turn a somersault from a squatting position



As a preparation for making a somersault have the child kneel on the floor mat and, keeping his head down, transfer his weight back and forth from his hands to his knees in a rocking manner.
Have the child kneel on the mat, head down, with his weight on his hands.
Guide the child as he pushes his weight forward, making sure that the top of his head touches the mat first, then the back of his neck, and top part of his back.

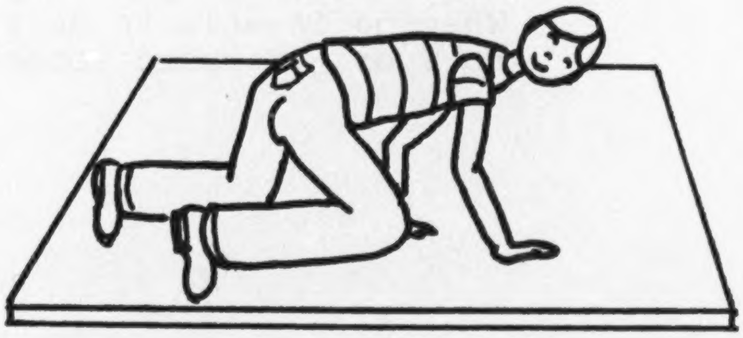
b. to turn two-three consecutive somersaults

When the child feels confident, allow him to make the somersault himself.
When he is able to do a single somersault have him do 2 or 3 forward somersaults in a row.

General Objective II: To develop the ability to perform unilateral motor acts smoothly with proper body alignment and control.

Specific Objective 1: To crawl in a unilateral pattern (right arm and right leg move together) --

Materials: Floor mat or rug
Have the child kneel on the mat placing his hands in front of him. Have the child transfer his weight to the arm and leg of the left side of his body and move the arm and leg on the right side forward. Then transfer the weight to the right side of his body and move the left arm and leg forward.



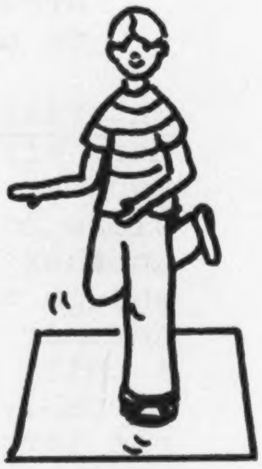
Specific Objective 2: To hop on both the left and right foot--

a. to stand on one foot

Have the child stand on one foot. A six-year-old child should be able to stand on one foot for 10 seconds (Doll, p. 8).
If the child has difficulty in maintaining his balance, hold his hands or have him support himself by holding a chair or wall.
Have him let go when he feels he can maintain his balance.

b. to hop once within a confined area

Materials: Masking tape, chalk
Mark off an area 18 x 18 inches square.
Have the child hop on one foot 1 time staying within the designated area.
Have him hop on the other foot staying within the designated area.



c. to hop several times within a confined area

Have the child hop on the preferred foot staying within the designated area. A five-year-old child should be able to hop 7 or 8 times within 5 seconds (Doll, p. 8).
Have the child hop on the non-preferred foot within the designated area.

d. to hop once with forward locomotion

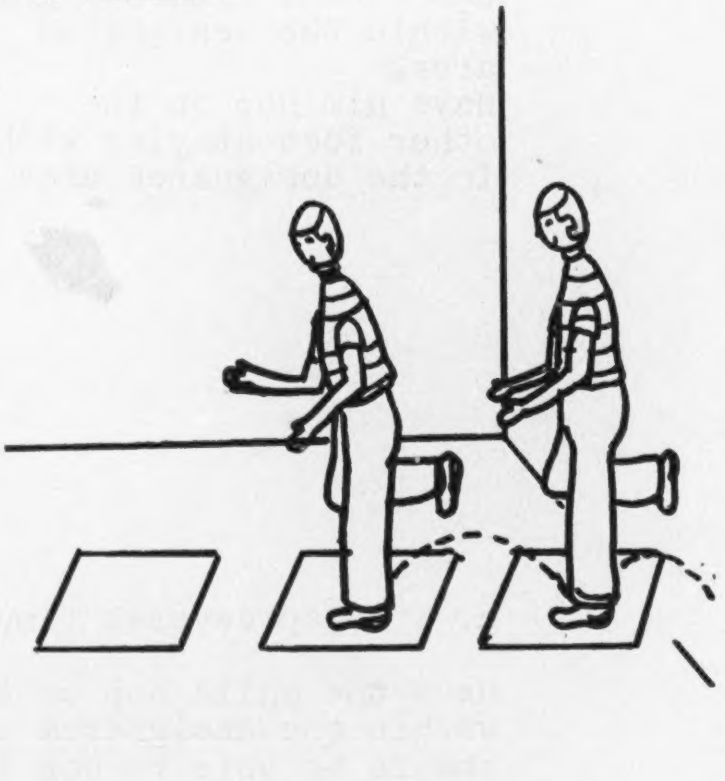
Hop once on the preferred foot moving forward in space. Hop once on the non-preferred foot, moving forward in space.
If the child is not able to maintain his balance have him hold onto a railing or use a wall as a support as he hops forward.

e. to hop forward for a distance of 5-8 feet

Hop moving forward on the preferred foot. Hop moving forward on the non-preferred foot.
A five-year-old should be able to hop for a distance of 16 feet.

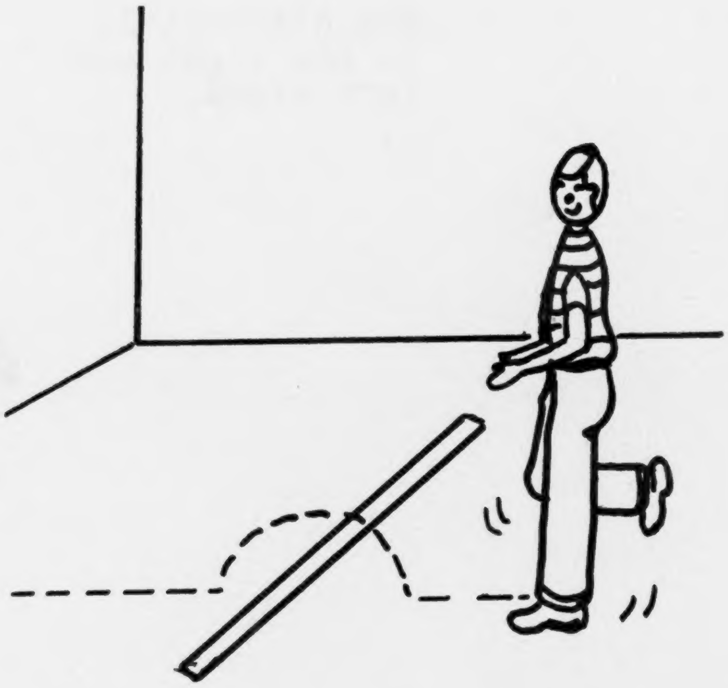
f. to hop from one target area to another target area, i.e., from one square marked on the floor to another square

Materials: Masking tape or chalk
Mark off three squares or circles close to one another -- close enough to one another so that a child can comfortably hop from one target area to the other. Have the child hop from one target to another without touching the designated boundaries.



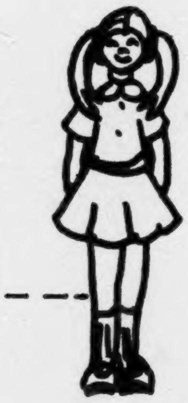
g. to hop over an obstacle

Place several obstacles on the floor. The obstacles should be carefully chosen so that if the child falls or steps on one he will not hurt himself. Begin by using a tape or chalk-drawn line. As the child becomes more competent in the activity, provide him with higher obstacles, such as sponges, hula hoops, jump ropes stretched between two chairs, etc.



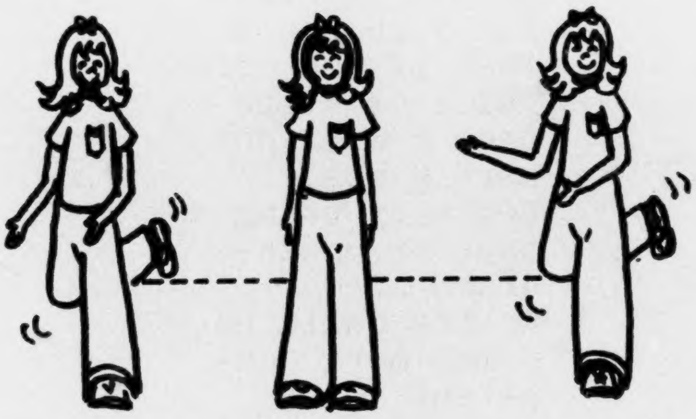
h. to hop once sideways

Hop to one side. Hop once to the opposite side.



i. to hop sideways several times, to the right and left sides

Hop alternately to the right and left sides.



j. to hop alternately first to the left, then to the right, several times

Hop alternately back and forth to the right and left sides rhythmically without stopping. When the child is able to do this activity, draw a line and have him hop back and forth over the line.

k. to hop backwards once

Hop backwards once on the preferred foot.
Hop backwards once on the non-preferred foot.
It may be necessary to hold the child's outstretched hands as he hops backwards, until he gains confidence in moving through space that he is not able to see.

l. to hop backwards several times

Hop backwards several times on the preferred foot.
Hop backwards several times on the non-preferred foot.
When the child is able to do this activity, mark off two parallel lines 12-18 inches apart and have the child hop backwards staying within the lines.
Direct his attention to the parallel lines that he can see in front of him, so that they can serve as guides for the direction of his backward movement.

General Objective III: To develop the ability to perform integrated (cross) lateral motor acts smoothly with proper body alignment and control.

Specific Objective 1: To crawl in an integrated lateral pattern --

a. to crawl forward

Have the child kneel on the rug or floor mat with his weight evenly distributed between his knees and his hands.
Move the left arm and right leg forward.
Move the right arm and left leg forward.
These movements will project the child forward.

b. to crawl around obstacles

When the child has mastered the coordination of crawling forward, have him crawl around an obstacle course that has been made from furniture and objects in the classroom.

c. to crawl backward

Move the left arm and right leg backward.
Move the right arm and left leg backward.
These movements will project the child's body backwards.

When the child has mastered the coordination of moving backwards, have him focus on a distant target that is in his line of sight.
Mark off two parallel lines 12-29 inches apart and have the child crawl backwards staying within the lines.
Direct his attention to the parallel lines that he can see in front of him so that he can use them as guides in his backward movement.

Specific Objective 2: To walk--

a. to walk on tiptoe

Walk on tiptoe.

b. to walk in a squatting position

Squat and walk forwards in a squatting position (duck walk).

c. to walk heel to toe

Walk forwards placing the heel of one foot directly in front of the toe of the other foot.

d. to walk keeping the knees in contact

Walk forward keeping the knees together.

e. to walk on the heel of the foot

Walk forward placing the body's weight on the heels of the feet.

f. to walk on a line drawn on the floor

Walk forward on an 8-foot straight line drawn or taped on the floor.
Walk forward on an 8-foot curved line taped or drawn on the floor.

g. to walk backward

Walk backward. For the child who feels insecure about walking backward, stand in front of him and hold his outstretched hands.
When the child is able to walk backward independently, have him do the activities again.

h. to walk around obstacles

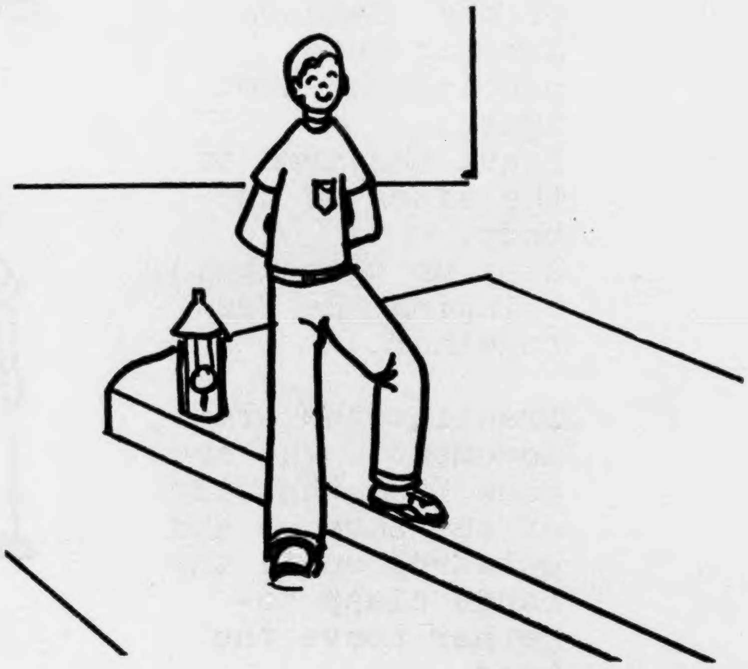
Make an obstacle course from furniture and objects in the classroom.
Have the child walk around the obstacles without touching them.
The obstacle course might include two chairs placed back to back, a chair placed near a wall, round tables, etc.

i. to walk between the rungs of a ladder

Make a ladder on the floor with taped lines or chalk lines.
Make the squares small enough so that the child can comfortably step from one to the other.
Have the child step inbetween the "rungs" of the ladder.
When the child is able to step inbetween the rungs of the line ladder, use a real ladder.
This activity may be done with the child moving forwards, sideways or backwards.

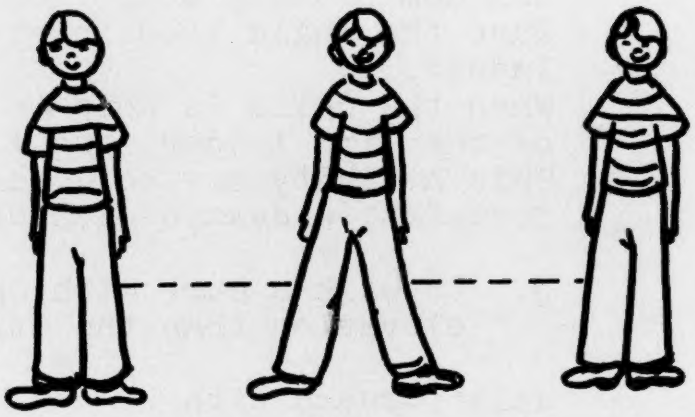
j. to walk a curb with one foot on a higher elevation than the other

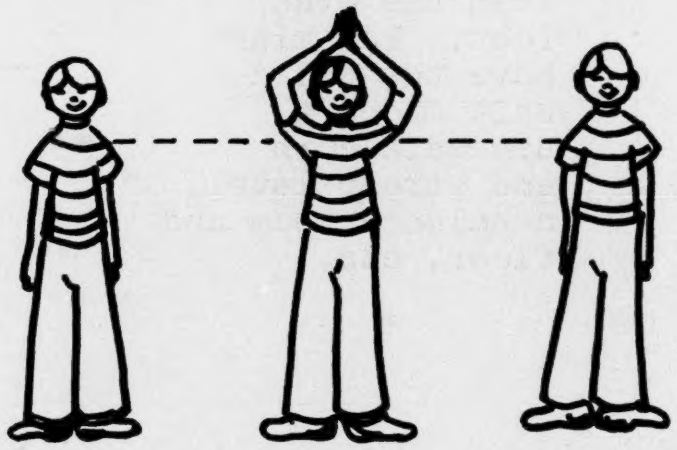
Walk forward with one foot on a different level than the other foot. You might have the child walk along a sidewalk curb and street level, a balance beam and floor, etc.



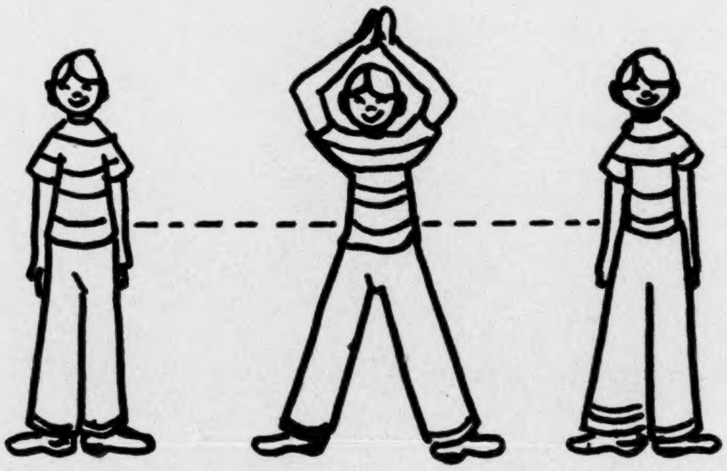
Specific Objective 3: To do "jumping jacks"--

Have the child do "jumping jacks". Begin in a standing position with the feet together and the arms at the side of the body. Break down the activity for the child to make sure he can do all of the components. Jump up once, placing the feet apart. Leave the arms at the sides of the body. Jump up once again, bringing the feet together.



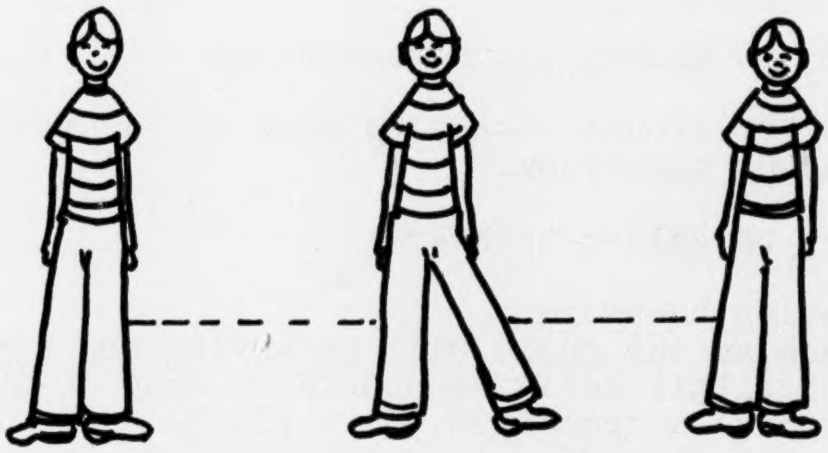


Practice the arm movement. The arms move from the side of the body up and outwards until the hands clasp together above the head. The arms should be outstretched above the head. Then the arms move down to the side of the body. To integrate the movement, jump up, placing the feet apart and the arms above the head; jump up once again bringing the feet together and the arms down to the side of the body.



Specific Objective 4: To do a series of step slides for a distance of 15-25 feet--

Practice the movement of step to the side, step together.
When the child has mastered these movements, have him do them faster so that when he brings his feet together he jumps.



Specific Objective 5: To gallop--

a. to gallop forward for 15-25 feet

Have the child gallop forward for a distance of 15-25 feet. The action of the gallop entails stepping forward with one foot then bringing the second foot up to meet it, stepping forward with the same foot again. This sequence is repeated, adding a jump as the child brings his feet together.

b. to gallop around obstacles

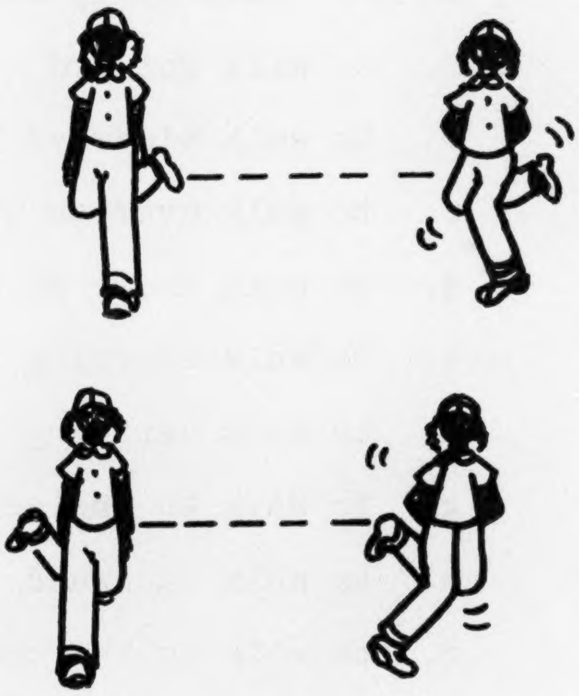
Gallop around obstacles made of furniture or objects in the classroom.

c. to gallop backwards

Gallop backward.
Because the child will be moving quickly through space, this activity should be done in an open area such as a gymnasium, on a playground, etc.

Specific Objective 6: To skip--

Before a child begins to skip he needs to integrate the motions of skipping. This is best done in place with a step-hop movement sequence, a transfer of weight to the other side of the body and another step-hop movement sequence.



a. to skip forward for 15-25 feet

Step on the right foot and hop, then step on the left foot and hop.
When the child can transfer his weight smoothly and perform the step-hop sequence, have the child add locomotion when he hops to complete the action of skipping.
As the child hops he should propel his body forward by sliding the standing foot along the floor.

b. to skip around obstacles

When the child has mastered the skipping action sequence, have him skip around an obstacle course made of furniture and objects found in the classroom.

Specific Objective 7: To maintain proper body alignment on a 4" wide strip of heavy carpeting--

a. to walk forward

b. to walk sideways using a step-slide motion

c. to walk over an obstacle

d. to walk under an obstacle

e. to walk carrying a weight in both hands

f. to walk carrying a weight in one hand

g. to walk to the center, turn around and walk back

h. to walk backward

i. to walk to the center, walk backward

j. to walk across the carpet with the eyes closed

k. to walk carrying something over the head

As a preparation for walking on a balance beam, have the children practice the activities on a 4-inch wide strip of carpeting or other textured material that will provide an additional tactile aid.

The strip of carpeting placed on the ground provides a less formidable task to the children and will allow them to develop balancing skills before they do the activities on a surface raised from the ground.

The following are a few of many activities that can be done on a 4-inch wide strip of carpeting. For additional activities we refer you to The Slow Learner in the Classroom by Newell Kephart, Enriching Perception and Cognition by Ray Barsch, and Developmental Sequences of Perceptual-Motor Tasks by Bryant Cratty.

Have the children remove their shoes so that they will get the benefit of the tactile feelings and have a better grip on the carpet.

The children may need you to provide additional support by holding their hands as they walk along, until they feel more secure in doing the activity.

a. Walk forwards.

b. Walk sideways using a step-slide motion.

c. Walk over an obstacle, such as a jumprope, blanket, book, etc.

d. Walk under an obstacle, such as a rope held over the child's head.

e. Walk carrying a weight in both hands.

f. Walk carrying a weight in one hand only. The child must compensate for the extra weight by leaning to the opposite side.

g. Walk to the center of the carpet, turn around without having the child's feet leave the carpet and walk back to the beginning of the carpet.

h. Walk along the carpeting backwards.

i. Walk to the center of the carpet, then walk backwards to the beginning of the carpet.

j. Walk across the carpet with closed eyes.

k. Walk carrying something lightweight held over the head, such as a yardstick, strip of foam rubber, paper tubing, etc.

Specific Objective 8: To maintain proper body alignment on a walking rail raised from 1"-6" off the floor, e.g., 4" wide or 2" wide balance beam, Harmon walking rail, Heath rails--

a. to walk forward

b. to walk sideways using a step-slide motion

c. to walk over an obstacle

d. to walk under an obstacle

e. to walk carrying a weight in both hands

f. to walk carrying a weight in one hand

g. to walk to the center of the rail, turn around and walk back

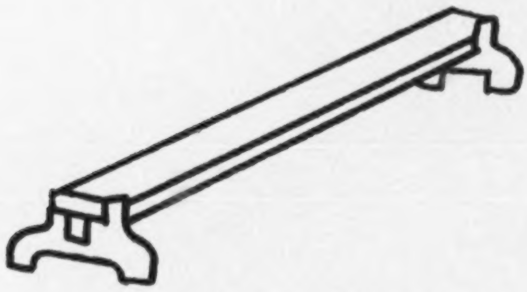
h. to walk backward

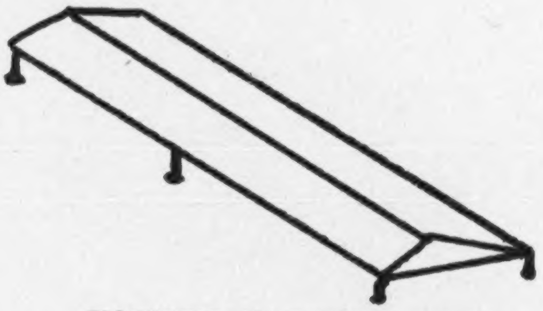
i. to walk to the center of the rail, return to the beginning of the rail walking backward

j. to walk across the rail with the eyes closed

k. to walk carrying something over the head

Walking a balance beam or walking rails is designed to improve the child's body alignment; should include a wide variety of activities done on the beam with assurance.
The rails should be no less than 6 feet in length to allow the child to walk a sufficient distance with the body in proper alignment. The beam of the balance beam has two widths, a 4-inch side and a 2-inch side. Until a child is quite competent in performing many different activities on the 4-inch side of the balance beam, he should not be expected to walk on the 2-inch surface of the beam with ease.


BALANCE BEAM


HARMON WALKING RAIL

The Harmon walking rail or tilted balance board is made of two pieces of wood which have a 15 degree downward slant. The rail permits the child to maintain proper body alignment without emphasis on balancing.

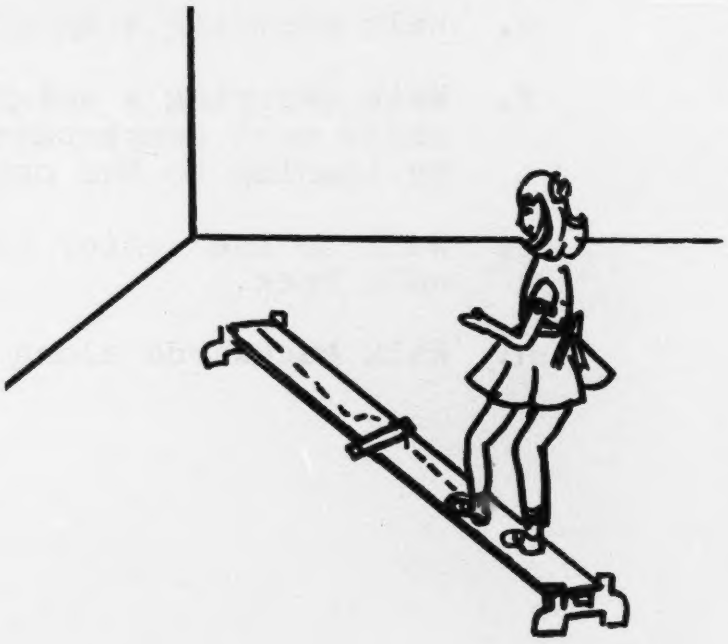
To encourage the child to use the tactile cues that he is receiving from his feet on the board, the child should be focussing on a target about 18 feet directly in front of the beginning of the board and at a slight downward angle, so that the target is within the child's line of vision. Using the target will promote correct alignment of the head, neck and shoulders.

Permit the child to try many of the different activities listed below to maintain the child's interest and to give him the physical experience of proper body alignment under many conditions. Activities in addition to those listed below may be found in The Slow Learner in the Classroom by Newell Kephart, Enriching Perception and Cognition by Ray Barsch and Developmental Sequences of Perceptual-Motor Tasks by Bryant Cratty.

a. Walk forward

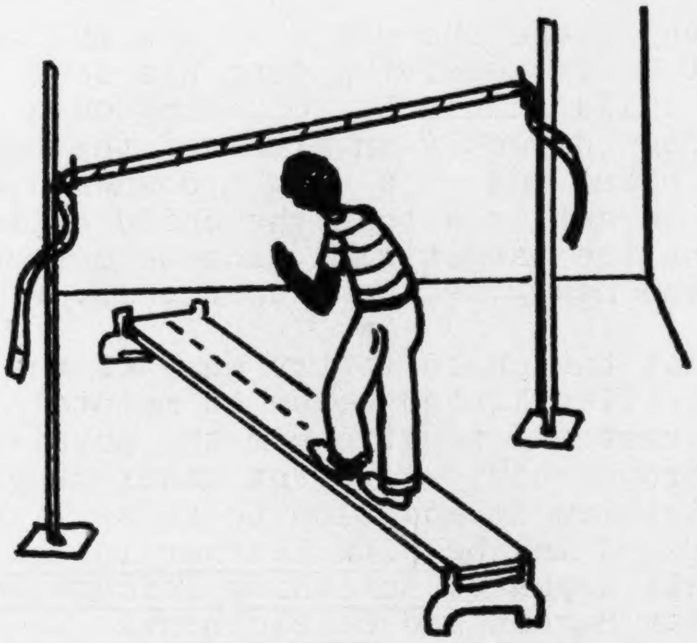
b. Walk sideways using a step-slide motion

c. Walk over an obstacle, such as a jumprope, blanket, book, etc.



d. Walk under an obstacle, such as a rope held over the child's head.

The lower the obstacle, the more difficult it will be for the child to walk underneath it.



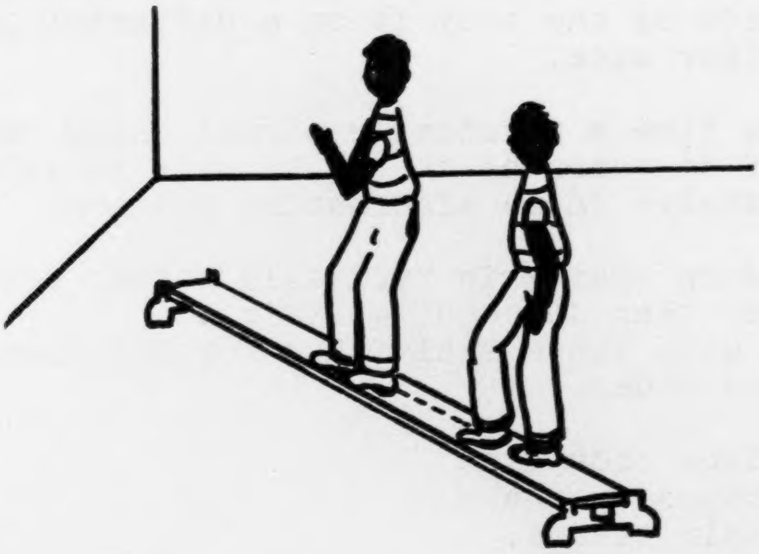
e. Walk carrying a weight in both hands.

f. Walk carrying a weight in one hand so that the child must compensate for the additional weight by leaning to the opposite side.

g. Walk to the center of the rail, turn around and walk back.

h. Walk backwards along the rail.

i. Walk to the center of the rail, return to the beginning of the rail walking backwards.



j. Walk across the rail with the eyes closed.

k. Walk across the rail carrying something lightweight over the head. The child might carry a yardstick, strip of foam rubber, article of clothing, etc.

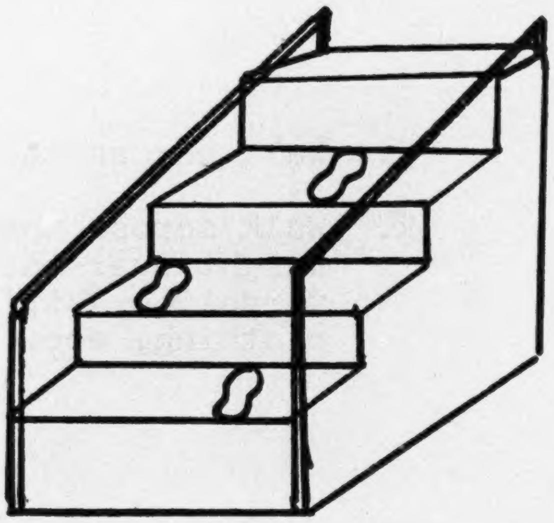
Specific Objective 9: To climb and descend stairs, alternating feet--

Climbing stairs requires the child to shift his weight from one side of his body to the other while one side of the body is on a different level from the other side.

By the time a physically normal child reaches the age of 4½ years he should be able to walk up and down stairs in an alternating pattern.

Ascending stairs is typically easier and is mastered earlier than descending stairs.
Begin with these activities for children 4½ years of age and older.

1. Place foot-like shapes on the stair treads. The child who is not yet able to climb stairs must cover the shapes with his foot and ascend stairs in an alternating pattern. Have the child ascend the stairs holding a railing and/or an adult's hand until the child has developed sufficient ability and confidence to climb the stairs by himself.



2. Follow the same procedure for teaching the child to descend the stairs in an alternating pattern. Remove the footlike shapes when the child automatically places one foot on each stair tread in an alternating fashion.
The following activities are preparatory to climbing and descending stairs in an alternating pattern: walking in a smooth, rhythmical manner between ladder rungs or walking forward through a series of squares, placing one foot into a square.

Specific Objective 10: To kick an object--
Kicking an object involves both gross motor action and visual perceptual judgment of the distance between the object and the child's body.

a. to kick a stationary object

Place a light weight, large object (bean bag, cardboard block) in front of the child on the floor, placing the object directly in front of the child so that he may kick it.

Have the child stand away from the object and take several steps towards it and kick it.

b. to kick a moving object

Roll a large lightweight ball slowly towards the child and have him kick it when it comes close to him.

General Objective IV: To develop the ability to perform bilateral eye-hand coordination activities smoothly and with control. All of the following activities are to be done using two hands. When the child is able to do these activities, only then should you begin instruction in General Objective IV, Specific Objective 2, catching and releasing objects with the preferred hand.

Specific Objective 1: To catch and release an object using both hands simultaneously, utilizing visual information--

a. to grasp and release a bean bag

As preparation for catching and throwing, make certain that the child has the physical coordination to grasp and release a ball or bean bag.
Have the child practice picking up and dropping the bean bag and ball with both hands.

b. to catch a thrown bean bag

Stand a short distance away from the child and throw the bean bag to him. Adjust the distance between yourself and the child until he can catch the bean bag. Gradually move further away from the child.

The act of catching a thrown object requires that both eyes function together to see the object as one single image. Observing the child's eyes while he is catching the bean bag will tell you whether or not he is looking at the object when it is thrown. If the child frequently misses the bean bag or frequently averts his eyes when it is thrown, we strongly urge you to follow your school's procedures for referral to an eye care specialist.

c. to throw a bean bag

Have the child throw a bean bag using two hands. At first allow him to throw just for the physical action of the arm movements and the coordination of releasing the bean bag.
When he has mastered the mechanics of the action have him throw the bean bag at a target.

d. to roll a large ($8\frac{1}{2}$"), medium (5") and small (3") (approximate sizes) ball

1. Roll a large ball from a sitting position.

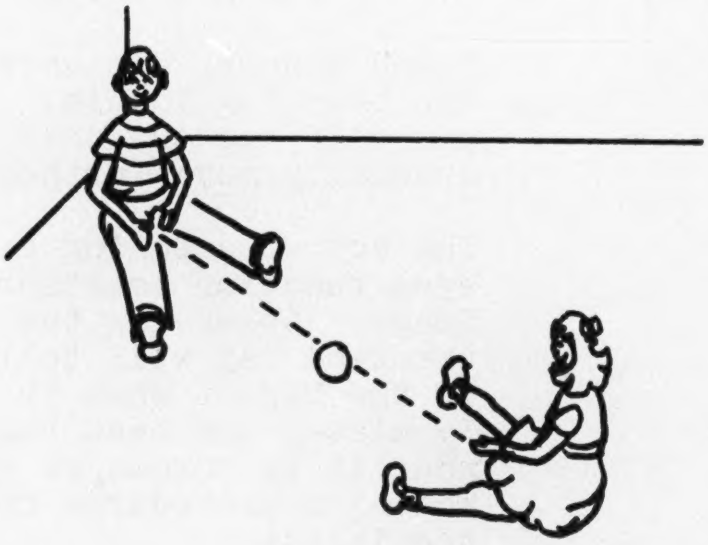
2. Roll a large ball from a squatting position.

3. When the child is able to roll a large ball, have him do the task using a medium sized ball and then a small ball.

e. to catch a rolled large, medium and small ball

1. Have the child sit on the floor. Roll the ball to the child and have him catch it.

2. Two children may enjoy rolling the ball back and forth to one another. This activity requires both eye coordination to catch the ball and muscular coordination to roll the ball.



3. As the child's ability to do this activity increases, use smaller balls. They are more difficult to catch and require more precise perceptual judgments and finer motor skill than the larger balls.

f. to roll a large ball to a large target 8 to 15 feet away

g. to roll a large ball to a small target 8 to 15 feet away

h. to roll a small ball to a small target 8 to 15 feet away

As the child's ability to aim at and accurately hit targets develops, many different games may be devised which will maintain his interest and allow him to continue to practice this skill. If the targets are varied, this will also help to keep him motivated.

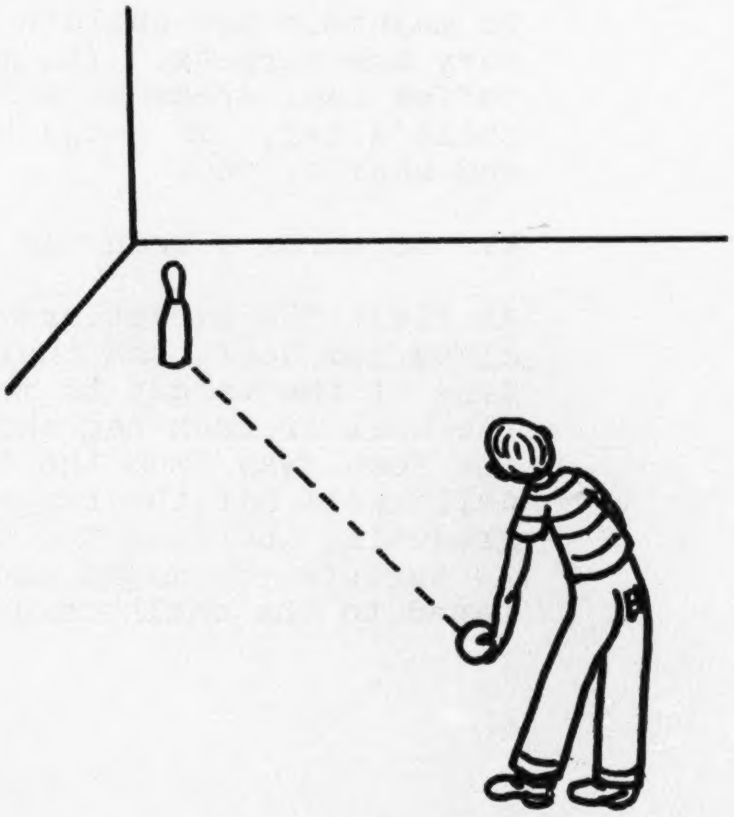
Hitting larger targets with large balls is easier than hitting small targets with small balls. Have the child do the following activities which are listed in order of difficulty.

A six-year old child should be able to hit a target from a distance of 5 feet (Doll, 1946).

1. Hit a large target with a large ball.

2. Hit a large target with a small ball.

3. Hit a small target with a small ball.



The greater the distance between the child and the target, the more difficult it will be for the child to hit the target. As the child is able to hit the target accurately you may make the task more challenging by moving the target further away.

i. to drop and catch a ball with both hands

1. Drop and catch a large ball with both hands.

2. Drop and catch a small ball with both hands.

If a child is having difficulty in catching the ball, have the child kneel so that the ball has a shorter distance to drop and rebound, and will remain within approximately the same vertical space.

j. to throw a bean bag or ball into a target area

At first the target areas should be large, e.g., a washtub, large carton, etc. The ball should be thrown from just a few feet away from the target. As the child becomes proficient, gradually decrease the size of the target and increase the distance from the target.

To maintain the child's interest in this activity, vary the targets. You might use a wastebasket, coffee can, areas marked off on the floor, another child's lap, or objects in the room such as table and chairs, etc.

k. to throw a bean bag or ball at a vertical target

At first the target area should be large, e.g., the classroom door, the chalkboard; later decrease the size of the target to make the task more challenging. The ball or bean bag should be thrown from just a few feet away from the target to insure that the child will hit the target. As he becomes proficient, gradually increase the distance from the targets. As targets you might use a drawing or photograph taped to the chalkboard.

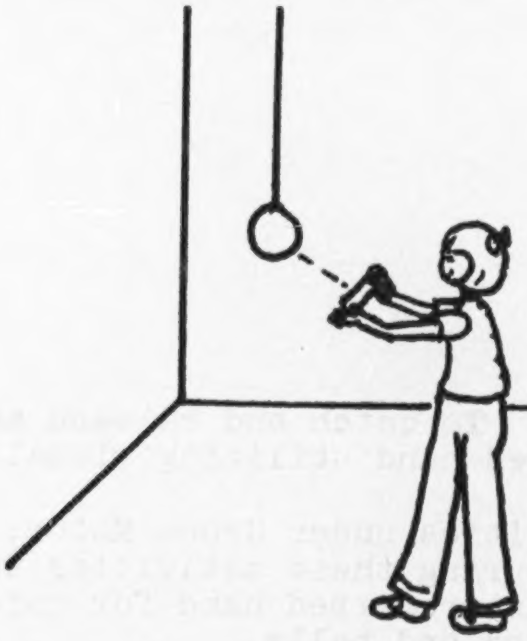
Specific Objective 2: To hit a suspended target--
(Suspend a ball from the ceiling so that it is free-swinging and adjusted in height to the child's line of vision.)

a. to hit a suspended target with an instrument held in both hands

Use an instrument such as paper tubing, a rolling pin or any other instrument which can be held with two hands. Hit the suspended ball. Bring the ball to rest and hit the ball again

b. to hit a suspended moving target with an instrument held in both hands

Hit the suspended target. When the target swings back hit the target again. Hit the target each time it swings within reach.



General Objective V: To develop the ability to perform unilateral eye-hand coordination activities smoothly and with control with the preferred hand.

Specific Objective 1: To catch and release an object with the preferred hand utilizing visual information--

Follow the activities under Gross Motor, General Objective IV. During these activities the child will be using his preferred hand for catching and throwing bean bags and balls.

Specific Objective 2: To hit a suspended target with the preferred hand utilizing visual information--

a. to hit a suspended target with the hand

Hit the target with an open hand. Bring the target to a stop and repeat the activity.

b. to hit a suspended target with an instrument

First use an instrument with a large surface, such as a ping pong paddle. Later as the child acquires more skill, use an instrument with less surface area, such as paper tubing, doweling, etc.

c. to hit a suspended moving object with the hand

Gently put the suspended ball in motion so that it swings slowly back and forth in front of the child. Have the child strike out when the ball comes within reach. If the child has a great deal of difficulty hitting the ball when it is in motion, return to the activities above, General Objective V, Specific Objective 1, where the object is stationary.

Once again, observe the child's eyes. If he frequently averts his eyes when the ball comes close to him, we suggest that you use your school's procedures for referring the child to an eye care specialist.

d. to hit a suspended moving target with an instrument

Use instruments such as ping pong paddles, paper tubing, doweling, etc. Gently put the ball in motion so that it swings slowly back and forth in front of the child. Strike out at the ball when it comes within reach.

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APPENDIX

A. Commercially Available Materials for Use with Curriculum Objectives

    1. Attention and Memory
    2. Visual Analysis
    3. Conceptualization
    4. Sensory Motor Integration
    5. Materials' Sources

B. Recommended Reading List

C. Developmental Evaluation Record

APPENDIX A

Commercially Available Materials for Use with Curriculum Objectives

Each of the commercially prepared materials below conforms to the criteria outlined in the Materials section under each Specific Objective in the curriculum. They have been carefully selected and evaluated for their effectiveness in helping children attain the goals of the curriculum.

This is by no means an exhaustive list of all games and materials that might be used in the activities of the CREED 5 Curriculum. While there are many excellent educational games and materials available, the final selection reflects those chosen by the CREED 5 staff. They were used in the classroom and evaluated by the teachers participating with the CREED 5 staff in the development and pilot trial of the curriculum. The final curriculum also includes suggestions for materials made by the participating teachers.

The organization of the materials list follows that of the curriculum guide, i.e., the commercially available materials are listed under the Specific Objectives for each curriculum area -- Attention and Memory, Visual Analysis, Conceptualization, Sensory Motor Integration and Gross Motor. When a suggested material has been recommended for use in connection with only one of the subsections of a Specific Objective, we have indicated it in parentheses after the name of the materials. For example, under Visual Analysis, General Objective VIII, Specific Objective 1, you will find Geometric Blocs (for Activity #7); this indicates that the Geometric Blocs are used only for Activity #7 in that objective. There are some objectives for which the materials are more readily available from regular classroom supplies or from neighborhood sources, such as hardware stores, than from school suppliers; in those cases we have not listed any commercial suppliers.

A listing in this Appendix does not constitute an endorsement of any commercial product. For those who do not wish to construct their own materials we are listing the names of some suppliers. Wherever possible, the names of more than one supplier of a material has been cited.

1. ATTENTION AND MEMORY

Because the objectives and activities for Attention and Memory are designed in conjunction with the objectives and activities of each of the other four areas, there are no materials specific to this area in the body of the CREED 5 Curriculum.

Teachers and supervisors, however, have suggested that we include within this section two sources that are designed for the specific development of Attention and Memory:

Detect Visual OPTA (Overhead Projector Tachistoscope Adaptor) Levels A,B,C, Workbooks Levels A,B,C, Transparencies	Science Research Associates
Listen, Look and Learn System Tach-X Tachistoscope Tach-X Accuracy Filmstrips Look and Write-Eye-hand coordination workbook. Readiness Pictures Filmstrip-Set. 4c.	Educational Developmental Laboratories, Inc., A Division of McGraw-Hill

2. VISUAL ANALYSIS

Objectives, Materials and Sources

GENERAL OBJECTIVE I: To match three-dimensional objects.

Specific Objective 1: to match toys, geometrical models, alphabet letters and numbers

Geometric Figures & Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks w/ Teachers Guide	Selective Educational Equipment
Logical Shapes	Responsive Environments
Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft

Specific Objective 2: to match objects of same size and shape, varying in color only

One-inch Colored Cubes	Milton Bradley; Developmental Learning Materials; Ideal
One-half Inch Beads	Milton Bradley; Ideal

Specific Objective 3: to match objects of same size and color, carying in shape only

Geometric Figures and Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environment
Fit-A-Space	Lauri Enterprises
Formboards, Shapes	Ideal

Specific Objective 4: to match objects of same color and shape, varying in size only

Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environments
Form Boards, Size	Ideal
Early Learning Kit	Creative Playthings
Building Cylinders	Responsive Environments
Knobless Cylinders	Educational Teaching Aids; J. A. Preston

GENERAL OBJECTIVE II: To match colors.

Specific Objective 1: to match from an array of different colors

One-inch Colored Cubes	Milton Bradley; Developmental Learning Materials; Ideal
One-half Inch Beads	Milton Bradley; Ideal
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environments

Specific Objective 2: to match from an array of shades of one color

Color Tablets	Educational Teaching Aids; J. A. Preston
Pantone Color Paper Selector	Available from art supply stores

GENERAL OBJECTIVE III: To match two-dimensional representations.

Specific Objective 1: to match colored pictures, black and white pictures, and drawings

Snappy Snap Cards	Responsive Environments
Inquisitive Games Picture Cards	Science Research Associates
Picture/Word Concepts Series	Instructor Publications
Visual Discrimination, Book 1: Pictures	Educational Teaching Aids

GENERAL OBJECTIVE IV: To match three-dimensional objects with two-dimensional representations of those objects.

Specific Objective 1: to match objects with a color photograph

Specific Objective 2: to match objects with a black-and-white photograph

Specific Objective 3: to match objects with a drawn representation

Inquisitive Games Picture Cards	Science Research Associates
Picture/Word Concepts Series	Instructor Publications
Geometric Figures and Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environment
Geometric Form Cards	Educational Teaching Aids

GENERAL OBJECTIVE V: To assemble materials to match a model.

Specific Objective 1: to assemble pieces of a real object, using the real object as a model

Playskool Village	Playskool--Milton Bradley
Shapees	Kohner Bros.

Specific Objective 2: to assemble geometric forms

Playfits	Constructive Playthings
Fraction Board	Selective Educational Equipment
Round Pegs - 2 inches long	Milton Bradley; Ideal

Specific Objective 3: to assemble a complex pattern

Fit-A-Space	Lauri Enterprises
Colorforms-Shapes	Creative Playthings
Chinese Tangram Puzzle	Selective Educational Equipment; Webster Div., McGraw-Hill
Discovery Blocks	Educational Teaching Aids

Specific Objective 4: to assemble letters from manipulable two-dimensional pieces

Alphabet Puzzle	Open Court Publishers

GENERAL OBJECTIVE VI: To match an inset with its outline.

Specific Objective 1: to match three-dimensional objects with their outlines

Discovery Tower	Childcraft
Fit-A-Space	Lauri Enterprises
Fraction Board	Selective Educational Equipment
Formboards-Shapes, Size, Animals	Ideal
Fit-A-Shape	Lauri Enterprises
Shape-O	Tupperware
Shape Sorting Box	Childcraft
Postal Station	Playskool-Milton Bradley

Specific Objective 2: to match two-dimensional shapes with their outlines

We Study Word Shapes	Dexter & Westbrook
Light and Shadows	Webster Div., McGraw-Hill
Positive Negative	Creative Playthings
Put Together Boards	MacMillan

Specific Objective 3: to match three-dimensional insets and outlines of written symbols

Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft
Three-Dimensional Alpha-a-Number, capitals and lower case	Lauri Enterprises

Specific Objective 4: to match printed letters, numbers, and shapes with printed outlines of those letters, numbers, and shapes

We study Word Shapes	Dexter and Westbrook

GENERAL OBJECTIVE VII: To develop the correspondence between tactile and visual perception of object characteristics.

Specific Objective 1: to match three-dimensional objects

Geometric Figures and Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environments
Vinyl Zoo Znimals	Childcraft
Animal Models (large)	Educational Teaching Aids
Rubber Zoo Animals	Creative Playthings
Plastic Play Foods	Childcraft; Constructive Playthings

Specific Objective 1: (Continued)

Doll House Furniture	Playskool-Milton Bradley; Childcraft; J. L. Hammett
Kitchen Utensil Set	Childcraft; L. L. Weans

Specific Objective 2: to match a three-dimensional object with a two-dimensional representation

Geometric Figures and Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environments
Geometric Form Cards	Educational Teaching Aids
Groovy Letters	Ideal
Groovy Numerals	Ideal
Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft
Beaded Alphabet Letters and Numerals	Touch
Vinyl Zoo Animals	Childcraft
Animal Models (large)	Educational Teaching Aids
Doll House Furniture	Playskool-Milton Bradley; Childcraft; J. L. Hammett
Plastic Play Foods	Childcraft; Constructive Playthings
Inquisitive Games Picture Cards	Science Research Associates
Picture/Word Concept Series	Instructor Publications

GENERAL OBJECTIVE VIII: To locate embedded figures.

Specific Objective 1: to locate printed forms embedded in overlays

Geometric Templates (for activity #7)	Science Research Associates
Figure Ground Transparencies	Speech and Language Materials
Perceptual Concepts Series--Figure Ground	Instructor Publications
Bits'O Wood (for Activity #6)	Otto Schmidt
Geometric Blocs (Ascoblocs -- for Activity #7)	Mead
Chart Marker (rubber stamps)	Krengel Mfg.; Otto Schmidt; L. L. Weans
Tactile Letter Blocks (for Activity #9)	Childcraft

GENERAL OBJECTIVE IX: To match printed forms.

Specific Objective 1: to match single geometric figures

Geometric Form Cards	Educational Teaching Aids
Geometric Dominoes	Childcraft; Educational Teaching Aids; Selective Educational Equipment
Geometric Shape Spotting	Childcraft; Selective Educational Equipment
Alike and Unalike Strip Books (A and F)	Responsive Environments; Educational Teaching Aids
Shapes: visual discrimination material	Educational Teaching Aids
Lines and Shapes: visual discrimination material	Educational Teaching Aids

Specific Objective 2: to match single symbols

Letter Sorting Strip Books (A-D)	Educational Teaching Aids; Responsive Environments
Sort-To-Match Books (A-D)	J. A. Preston
Printscript Numerals	Responsive Environments
Chart Marker (rubber stamps)	Krengel Mfg.; Otto Schmidt; L. L. Weans
Reading Letters: Books 1 and 2	Learning Research Associates

Specific Objective 3: to match sets of geometric figures

Spot the Set	Childcraft; Selective Educational Equipment
Reading Readiness Set	Educational Teaching Aids
Observation Matching Cards	Constructive Playthings

Specific Objective 4: to match sets of symbols

Letter/Numeral Stamp Sets	Responsive Environments
Printscript Numerals	Responsive Environments
Chart Marker (rubber stamps)	Krengel Mfg.; Otto Schmidt; L. L. Weans
Twirl-A-Word	Childcraft
Try It	Constructive Playthings
Turn-A-Word	J. A. Preston
Reading Letters: Book 2	Learning Research Associates
Solve-It	Childcraft
Say-It Addition Game	Garrard Publications
Say-It Subtraction Game	Garrard Publications
Letter-Sorting Strip Book (E-H)	Educational Teaching Aids; Responsive Environments
Sort-To-Match Books	J. A. Preston
One-Inch Beads	Milton Bradley; Ideal

GENERAL OBJECTIVE X: To duplicate the spatial organization of shapes and symbols.

Specific Objective 1: to duplicate the spatial organization of three-dimensional objects and symbols

Pre-Writing Designs	Developmental Learning Materials
One-Inch Plain Cubes	Milton Bradley; Developmental Learning Materials
One-Inch Colored Cubes	Ideal School Supply
One-Half Inch Beads	Milton Bradley; Ideal
Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft

Specific Objective 2: to duplicate spatial organization of printed symbols

Letter/Numeral Stamp Sets	Responsive Environments
Chart Marker (rubber stamps)	Krengel Mfg.; Otto Schmidt; L. L. Weans
Printscript Numerals	Responsive Environments
Letters Make Words	Milton Bradley

3. CONCEPTUALIZATION

Objectives, Materials and Sources

GENERAL OBJECTIVE I: To classify by similarities.

Specific Objective 1: to sort by shared attributes

Colorforms - Shapes	Creative Playthings
Geometric Figures and Solids	Milton Bradley
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Logical Shapes	Responsive Environments
Bag of Colored Blocks	Playskool-Milton Bradley
One-inch Colored Cubes	Ideal; Developmental Learning Materials; Milton Bradley
Geometric Dominoes	Childcraft; Selective Educational Equipment; Educational Teaching Aids
Geometric Form Cards	Educational Teaching Aids
Alike-Unalike Strip Books A,B,C,D and F (For Activity #2)	Responsive Environments; Educational Teaching Aids
New Dimensions in Mathematics: Readiness Book B (For Activity #6)	Harper & Row

Specific Objective 2: to sort by functional association

Motor Expressive Picture Cards, I and II	Developmental Learning Materials
Jumbo Lotto: Community Helpers	Ed-U-Cards

Specific Objective 2: to compare collections of objects by perceptible attributes

Early Learning Kit	Creative Playthings
Formboards - Size	Ideal
Learning Readiness System: LRS Seriation Test. Workbooks and Teacher's Guide	Harper & Row
Colorforms-Shape	Creative Playthings
People Pieces	Selective Educational Equipment
Logical Shapes	Responsive Environments
Geometric Blocs (Ascoblocs)	Mead
Giant Attribute Blocks	Selective Educational Equipment
Shape Matching Cubes	Responsive Environments; Childcraft
Matching Geometric Cube Set	J. A. Preston
New Dimensions in Mathematics: Readiness Books, A, B, Teacher's Edition	Harper & Row

GENERAL OBJECTIVE III: to represent, code, and symbolize objects, actions and events.

Specific Objective 1: to match simple sequences

Letter and Numeral Stamp Sets	Responsive Environments
Printscript Numerals	Responsive Environments
Chart Marker (rubber stamps)	Krengel Mfg.; Otto Schmidt; L. L. Weans
Colorforms-Shape	Creative Playthings
Inquisitive Games Picture Cards	Science Research Associates
Picture-Word Concepts Series	Instructor Publication
Pre-Writing Designs	Developmental Learning Materials
One-inch Colored Cubes	Ideal; Milton Bradley; Developmental Learning Materials
One-half-inch Beads	Ideal; Milton Bradley
Twirl-A-Word	Childcraft
Try It	Constructive Playthings
Turn-A-Word	J. A. Preston
Vinyl Zoo Animals	Childcraft
Vinyl Farm Animals	Childcraft
Animal Models (large)	Educational Teaching Aids
Letter Constancy Cards	Developmental Learning Materials

Specific Objective 2: to create representations

Match and Measure	Webster Div., McGraw Hill
Light and Shadows	Webster Div., McGraw Hill

Specific Objective 3: to recognize items from representations

Specific Objective 4: to represent objects through actions

Specific Objective 5: to use symbolically represented plans to structure actions and sequences of actions

Traffic Sign Set	Otto Schmidt; Childcraft; J. A. Preston

Specific Objective 6: to understand directions using attributes of objects to represent objects and symbols to represent actions.

Color Paddles	Creative Playthings; Childcraft; J. L. Hammett

GENERAL OBJECTIVE IV: To structure space; i.e., to use spatial concepts

Specific Objective 1: to understand in-out; on-off; in front of - in back of; on top of - under

Discovering Opposites	Instructo
Spatial Relations Picture Card I	Developmental Learning Materials
New Dimensions in Math: Readiness Books, A,B,C	Harper & Row

Specific Objective 2: to understand proximity relationships

One-inch Colored Cubes	Ideal; Milton Bradley; Developmental Learning Materials
Pre-writing Designs	Developmental Learning Materials
Bag of Colored Blocks	Playskool-Milton Bradley
Picture-Word Concepts Series	Instructor Publication
Inquisitive Games Pictures	Science Research Associates
Vinyl Farm Animals	Childcraft
Vinyl Zoo Animals	Childcraft
Wild Animals	Dick Blick
Playskool Village	Playskool-Milton Bradley

Specific Objective 3: to understand spatial transformations and part-whole relationships

Designs in Perspective	Developmental Learning Materials
Fit-A-Space	Lauri Enterprises
Bolt-It	Childcraft
Wood Toy Builder	Playskool-Milton Bradley
Playskool Village	Playskool-Milton Bradley
Fraction Board	Selective Educational Equipment
Playfits	Constructive Playthings
Put Together Boards	MacMillan
Mix and Match Blocks	MacMillan
Shapees	Kohner Bros.; Childcraft; Constructive Playthings
Alphabet Puzzles	Open Court
Block House	Childcraft
Take-Apart House	Dick Blick
Cubasco Puzzle Blocks	Mead
Alike-Unalike Strip Book E	Responsive Environments; Educational Teaching Aids
Chinese Tangram Puzzle	Selective Educational Equipment; Webster Div.-McGraw Hill
Tangram -- 330 Puzzles	Selective Educational Equipment
One-inch Colored Cubes	Ideal; Developmental Learning Materials; Milton Bradley

GENERAL OBJECTIVE V: To understand logical sequences across time.

Specific Objective 1: to complete an ordered set

Block House	Childcraft
Take-Apart House	Dick Blick
Early Learning Kit	Creative Playthings
Boy and Girl Manikin with Vinyl Clothing	American Guidance Service

Specific Objective 2: to put objects together in a fixed sequence

Block House	Childcraft
Take-Apart House	Dick Blick
Early Learning Kit	Creative Playthings
Boy and Girl Manikin with Vinyl Clothing	American Guidance Service

Specific Objective 3: to create spatial arrangements corresponding to temporal sequences of actions

Early Learning Kit	Creative Playthings
Block House	Childcraft
Take-Apart House	Dick Blick
Boy and Girl Manikin with Vinyl clothing	American Guidance Service

Specific Objective 4: to act out the next step in a behavior sequence

Specific Objective 5: to record an event by portraying the steps of the event

Changes - Teacher's Guide	Webster Div., McGraw-Hill
Starting From Seeds Kit, with Teacher's Guide	

Specific Objective 6: to predict "what comes next" in a short sequence of pictures

What Comes Next Board	MacMillan
Judy SeeQuees Sequences	Judy Co.; General Learning Corporation
Sequential Picture Cards I and II	Developmental Learning Materials
The Apple and the Moth	Random House/Singer
The Chicken and the Egg	Random House/Singer

Specific Objective 7: to arrange a picture story in sequence, using perceptual supports

What Comes Next Boards	MacMillan

Specific Objective 8: to arrange a picture story in sequence without perceptual supports

What Comes Next Boards	MacMillan
Judy SeeQuees Sequences	Judy Co. - General Learning Corp.
Sequential Picture Cards II and III	Developmental Learning Materials

GENERAL OBJECTIVE VI: To develop number and measurement concepts.

Specific Objective 1: to make gross comparisons of quantity

Specific Objective 2: to gain experience with pairs, one-to-one correspondence

Discovery Tower	Childcraft
Number Sorter	Creative Playthings; Childcraft; J. A. Preston Corp.

Specific Objective 3: to arrange and rearrange sets of objects

Conservation Of Number Strip Book: Counting & Matching	Educational Teaching Aids
Conservation of Number Sorting Cards	Educational Teaching Aids
Developing Pre-Number Ideas pp. 54,55,56,57,68,69,70,71	Holt, Rinehart and Winston
Sets and Numbers: Level K pp. 6-17	Random House/Singer
New Dimensions in Mathematic: Readiness Book A, pp.84-87; Readiness Book C, pp.96-107	Harper & Row
Sets and Numbers: Level 1, pp.73,74,114,115,120,124,125, 133,134,139,140	Random House/Singer

Specific Objective 4: to be able to choose "enough" of one kind of object to put together with another kind

Specific Objective 5: to make judgments of number equivalence across time

Specific Objective 6: to make judgments of number or quantity across time

Specific Objective 7: to experiment with size and distance judgments

Match and Measure	Webster Division-McGraw Hill

Specific Objective 8: to make judgments of quantities in volume

Specific Objective 9: to make judgments of equivalence and non-equivalence, using a balance scale

Large Balance	Selective Educational Equipment
The Balance Book--Teacher's Guide	Webster Div., McGraw-Hill

Specific Objective 10: to experiment with the concept of symmetry

Mirror Cards with Teacher's Guide	Webster Div., McGraw-Hill

4. SENSORY MOTOR INTEGRATION

Objectives, Materials and Sources

GENERAL OBJECTIVE I: To develop manual strength and dexterity with minimal use of vision.

Specific Objective 1: to make finger movements

Specific Objective 2: to grasp and release objects with whole hand

Theraplast	J. A. Preston
Digitator	J. A. Preston

Specific Objective 3: to move the thumb and four fingers in opposition

Plush Animal Puppets	Childcraft
Puppets (from Peabody Language Development Kit)	American Guidance Service
Hand Puppets	Educational Teaching Aids; Community Playthings; J. L. Hammett

Specific Objective 4: to move the thumb and little finger in opposition

Hand Puppets	Childcraft; Educational Teaching Aids; J. L. Hammett

Specific Objective 5: to move the forefinger with clenched fist

Magic Fingers	Sparks Manufacturing Co.

Specific Objective 6: to rotate wrists

Twist O Fit	Responsive Environments
Nuts 'N' Bolts	Child Guidance Toys
Chunky Nuts	Childcraft

Specific Objective 7: to rotate wrists in opposite directions

Turning	Creative Playthings

Specific Objective 8: to grasp and release with thumb and forefinger

Specific Objective 9: to rotate objects with thumb and forefinger

Bolt-It	Childcraft
Bolts 'N' Nuts	Kohner Bros.
Bolts 'N' Nuts Builder	Constructive Playthings
Workbench	Playskool-Milton Bradley
Wood Toy Builder	Playskool-Milton Bradley

Specific Objective 10: to oppose thumband bent fore- or middle finger

Child-sized scissors	J. A. Preston; J. L. Hammett; Otto Schmidt
Double-handled scissors	Developmental Learning Materials

GENERAL OBJECTIVE II: To coordinate eyes and hand in performing manipulative tasks.

Specific Objective 1: to pick up and drop large objects with whole hand

Specific Objective 2: to stack three-dimensional forms

One-inch Cubes	Ideal; Milton Bradley; Developmental Learning Materials
One-inch square and cylindrical beads	Ideal; Milton Bradley
One-half inch and cylindrical beads	Ideal; Milton Bradley

Specific Objective 3: to pour dry material

Specific Objective 4: to pour liquids

Specific Objective 5: to pick up and release small objects with thum and forefinger

Specific Objective 6: to insert small objects into stationery openings

Jumbo Pegboard with Pegs	Ideal; Responsive Environments; Childcraft
Standard-sized Pegboard with Pegs	Ideal; Responsive Environments; Childcraft

Specific Objective 7: to insert small objects into small openings in sequence

Jumbo Pegboard - Tactilmat	Ideal
Jumbo Pegs For Stringing	Ideal

GENERAL OBJECTIVE III: To coordinate eyes and hands

Specific Objective 1: to insert small objects into small openings with both hands

Wood Toy Builder	Playskool-Milton Bradley
Bolt-It	Childcraft
Bolts 'N' Nuts	Kohner Bros.
Bolts 'N' Nuts Builder	Constructive Playthings
Dressing Vests	Educational Teaching Aids; Dick Blick
Learning to Dress	Childcraft

Specific Objective 2: to insert objects into small openings in sequence

Lacing Cards	Developmental Learning Materials; J. L. Hammett
Sewing and Pasting	Creative Playthings
Sew-So Board	Creative Playthings

Specific Objective 3: to manipulate scissors within a limited area

Child-sized Scissors	J. A. Preston; J. L. Hammett; Otto Schmidt
Double-handled Scissors	Developmental Learning Materials
Beginning to Learn: Fine Motor Skills Workbook pages 15,25,35,45,55,63,73 83,91	Science Research Associates

GENERAL OBJECTIVE IV: To utilize a tool to pick up and place objects

Specific Objective 1: to pick up and release small objects with a tool

Magic Fingers	Sparks Mfg. Co.

Specific Objective 2: to pick up, place, and release small objects

Magic Fingers	Sparks Mfg. Co.

GENERAL OBJECTIVE V: To sustain rhythmical movement.

Specific Objective 1: with both arms

Bobo Punch Toy	Childcraft
Smacko The Clown	F.A.O. Schwarz
Punching Bag On Stand	Childcraft; J. A. Preston; F.A.O. Schwarz

Specific Objective 2: with one arm

Whirla	Creative Playthings
Bobo (Clown) Punch Toy	Childcraft
Smacko The Clown	F.A.O. Schwarz
Punching Bag on Stand	Childcraft; J. A. Preston; F.A.O. Schwarz
Pounding Bench	Playskool; Samsonite Pre-School Toys

Specific Objective 3: with both arms, in integrated movement

One-Two	Creative Playthings
Bobo Punch Toy	Childcraft
Smacko The Clown	F.A.O. Schwarz
Punching Bag on Stand	Childcraft; J. A. Preston; F.A.O. Schwarz

GENERAL OBJECTIVE VI: To develop awareness of body boundaries

Specific Objective 1: to move the body in space

GENERAL OBJECTIVE VII: To develop tactile-kinesthetic awareness of body.

Specific Objective 1: with tactile stimulation

Manikin (Peabody Language Development Kit #P)	American Guidance Service
Body Concept Dittos I & II	Developmental Learning Materials
Position in Space Posters	Developmental Learning Materials

Specific Objective 2: with visual stimulation

Position In Space Posters	Developmental Learning Materials
Body Concept Dittos I & II	Developmental Learning Materials
Manikin - Peabody Picture Language Development Kit	American Guidance Service
Light and Shadows	Webster Div., McGraw-Hill

GENERAL OBJECTIVE VIII: To develop awareness of spatial relationship of body parts.

Specific Objective 1: to identify a missing part in a three-dimensional representation of the body.

Specific Objective 2: to identify a missing part in a two-dimensional representation of the body

Specific Objective 3: to identify a missing part in a drawn representation of the body

Body Concept Dittos	Developmental Learning Materials

Specific Objective 4: to assemble a three-dimensional model of the body

Specific Objective 5: to assemble a two-dimensional model of the body

Specific Objective 6: to assemble pictures of individual parts of the body

Specific Objective 7: to draw the missing parts of the body

Body Concept Dittos I and II	Developmental Learning Materials
Beginning To Learn: Fine Motor Skills Workbook, pp. 93-96	Science Research Associates

GENERAL OBJECTIVE IX: To hold and manipulate broad point and fine point tools.

Specific Objective 1: within large areas

GENERAL OBJECTIVE X: To manipulate a tool within a template to produce unbroken line

Specific Objective 1: ON A HORIZONTAL PLANE

Chalkboard Templates	Webster Div., McGraw-Hill; J. A. Preston
Geometric Templates	Science Research Associates
Beginning To Learn: Fine Motor Skills Workbook and Teachers Manual	Science Research Associates
Stencils - Clear, Shape, Animal, Farm and Transportation, Seasonal	Developmental Learning Materials
Puzzle Blocks	Kohner Bros.

GENERAL OBJECTIVE XI: To manipulate a tool to fill in a designated area

Specific Objective 1: to fill in a large area with broad boundaries

Beginning To Learn Fine Motor Skills Workbook	Science Research Associates

Specific Objective 2: to fill in a small area with narrow boundaries

Beginning To Learn: Fine Motor Skills Workbook	Science Research Associates

GENERAL OBJECTIVE XII: to manipulate a tool to draw a line between two lines

Specific Objective 1: with lines 1" apart

Frostig Visual-Motor Coordination-- Spirit Masters	Follett

Specific Objective 2: with lines 1/2" apart

Frostig Visual-Motor Coordination-- Spirit Masters	Follett
Beginning to Learn: Fine Motor Skills Workbook	Science Research Associates

Specific Objective 3: with lines 1/4" apart

Frostig Visual-Motor Coordination-- Spirit Masters	Follett
Beginning to Learn: Fine Motor Skills Workbook	Science Research Associates

GENERAL OBJECTIVE XIII: To connect two points with a line.

Specific Objective 1: with points 1" or less apart

Frostig Visual-Motor Coordination-- Spirit Masters	Follett
Beginning To Learn: Fine Motor Skills Workbook	Science Research Associates

Specific Objective 2: with points more than 1" apart

Frostig Visual-Motor Coordination-- Spirit Masters	Follett
Beginning to Learn: Fine Motor Skills	Science Research Associates

GENERAL OBJECTIVE XIV: To manipulate a tool around the outside of a template in an unbroken line.

Specific Objective 1: with a circular template

Specific Objective 2: with a many-sided template

GENERAL OBJECTIVE XV: To trace a previously drawn line.

Specific Objective 1: simple shape or picture

Clear Acetate Sheets -- 7½ gauge	Any educational supply house
Watercolor Marker 7500	Eberhard Faber

Specific Objective 2: complex shape or figure

Clear Acetate Sheets -- 7½ gauge	Any educational supply house
Watercolor Marker 7500	Eberhard Faber

Specific Objective 3: to trace symbols (letters and numbers)

Groovy Letters	Ideal
Groovy Numerals	Ideal
Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft

GENERAL OBJECTIVE XVI: To reproduce drawings and symbols from a model.

Specific Objective 1: to imitate the teacher's movements to produce a drawing

Specific Objective 2: to copy a single printed figure

Groovy Letters	Ideal
Groovy Numerals	Ideal
Tactile Letter Blocks	Childcraft
Tactile Numeral Blocks	Childcraft
Beaded Alphabet & Numerals	Touch

Specific Objective 3: to copy a sequence of printed symbols

Specific Objective 4: to copy several sequences of printed symbols

5. MATERIALS' SOURCES

American Guidance Service, Inc.
Publishers Building
Circle Pines, Minnesota 55014

Blick, see Dick Blick

Bradley, see Milton Bradley

Childcraft Education Corp.
964 Third Ave.
New York, N. Y. 10022

Child Guidance Toys
200 Fifth Ave.
New York, N. Y. 10010

Constructive Playthings
1040 East 85th St.
Kansas City, Missouri 64131

Creative Playthings
Post Office Box 1100
Princeton, N. J. 08540

Developmental Learning Materials
3505 N. Ashland Ave.
Chicago, Illinois 60657

Dexter & Westbrook, Ltd.
111 South Centre Ave.
Rockville Centre, N. Y. 11571

Dick Blick
P.O. Box 1267
Galesburg, Ill. 61401

Eberhard Faber Pen and Pencil Co.
200 Fifth Avenue
New York, N. Y. 10010

Ed-U-Cards
60 Austin Blvd.
Commack, N. Y. 11725

Education Development Center
55 Chapel Street
Newton, Massachusetts 02160

Educational Teaching Aids
Div. A. Daigger & Co.
159 W. Kinsie Street
Chicago, Illinois 60610

F. A. O. Schwarz
745 Fifth Ave.
New York, N. Y.10022

Follett Publishing Co.
1010 W. Washington Blvd.
Chicago, Ill. 60607

Garrard Publishing Co.
Champaign, Illinois 61820

General Learning Corp.
see The Judy Co.

GMS Educational Products
P. O. Box 5563
Winston-Salem, N. C. 27103

Hammett, see J. L. Hammett

Harper and Row, Publishers
School Department
2500 Crawford Ave.
Evanston, Ill. 60201

Holt, Rinehart & Winston
383 Madison Ave.
New York, N. Y. 10017

Ideal School Supply Co.
11000 S. Lavergne Ave.
Oak Lawn, Ill. 60453

Instructo Products
Paoli, Pa. 19301

The Instructor Publications, Inc.
Dansville, N. Y. 14437

J. A. Preston Corp.
71 Fifth Avenue
New York, N. Y. 10003

J. L. Hammett Co.
2393 Vaux Hall Road
Union, N. J. 07083

The Judy Company
General Learning Corp.
Morristown, N.J. 07960

Kohner Bros., Inc.
P. O. Box 158
East Paterson, N. J. 07407

Krengel Mfg. Co., Inc.
323 W. 39th St.
New York, N. Y. 10018

Lauri Enterprises, Mfrs.
Phillips-Avon, Maine 04966

Learning Research Associates,
Inc.
1501 Broadway
New York, N. Y. 10036

L. L. Weans Co., Inc.
33 Seabro Avenue
Amityville, N. Y. 11701

The MacMillan Company
School Division
866 Third Ave.
New York, N. Y. 10022

McGraw-Hill Book Company
Webster Division
Manchester Road
Manchester, Mo. 63011

Mead Educational Services
245 N. Highland Ave.
Atlanta, Ga. 30307

Milton Bradley Co.
Springfield, Mass. 01101

Open Court Publishing Co.
Box 599
LaSalle, Illinois 61301

Otto Schmidt & Son, Inc.
117 South Fourth Street
New Hyde Park, L.I., N.Y.

Playskool-Milton Bradley Co.
3720 N. Kedzie Ave.
Chicago, Ill. 60618

Preston, see J. A. Preston

Random House Singer
School Division
201 East 50th Street
New York, N. Y. 10022

Responsive Environments
Corp.
Learning Materials Div.
Englewood Cliffs, N.J. 07632

Samsonite Corporation
Toy Division
Denver, Colorado 80217

Schmidt, see Otto Schmidt
& Son, Inc.

Schwartz, see F.A.O. Schwartz

Science Research Associates,
Inc.
259 East Erie Street
Chicago, Illinois 60611

Selective Educational
Equipment
3 Bridge Street
Newton, Mass. 02195

Sparks Manufacturing Co.
1010 Center Street
Throop, Pa. 18512

Speech and Language
Materials, Inc.
P. O. Box 721
Tulsa, Oklahoma 74101

Touch, Inc.
Otto Schmidt - distributor

Tupperware Toys
Orlando, Florida 32802

Weans, see L. L. Weans Co., Inc.

Webster Div. - McGraw-Hill
see McGraw-Hill

APPENDIX B

SELECTED REFERENCES

In the course of a comprehensive survey of existing programs, publications and films which were relevant to the five areas of the CREED curriculum, members of the curriculum staff made special note of those which might aid teachers in acquiring a thorough understanding of the theoretical framework of the CREED curriculum, and sources for the expansion of activities. We believe that the selected listing below will be valuable for the school's professional library.

Theoretical Framework

Athey, I. J. & Rubadeau, D. O. (Eds.) Educational implications of Piaget's theory. Waltham, Mass.: Ginn & Co., 1970.

Bloom, B. S., Hastings, J. T., & Madaus, G. F. Handbook on formative and summative evaluation of student learning. New York: McGraw-Hill, 1971.

Featherstone, J. The primary school revolution in Britain. New York: Pitman, 1969.

Furth, H. G. Piaget and knowledge: Theoretical foundations. Englewood Cliffs, N. J.: Prentice-Hall, 1969.

Furth, H. G. Piaget for teachers. Englewood Cliffs, N. J.: Prentice-Hall, 1970.

Gagne, R. M. The conditions of learning. New York: Holt, Rinehart & Winston, 1970.

Ginsburg, H. & Opper, S. Piaget's theory of intellectual development: An introduction. Englewood Cliffs, N. J.: Prentice-Hall, 1969.

Hunt, J. McV. Intelligence and experience. New York: Ronald Press, 1961.

Hunt, J. McV. The challenge of incompetence and poverty. Urbana, Ill.: Univ. of Illinois Press, 1969.

Inhelder, B. & Piaget, J. The early growth of logic in the child: Classification and seriation. New York: W. W. Norton & Co., 1964.

Kephart, N. Slow learner in the classroom. Columbus, Ohio: Chas. Merrill, 1960.

Phillips, J. L. The origins of intellect: Piaget's theory. San Francisco: W. H. Freeman & Co., 1969.

Piaget, J. & Inhelder, B. The psychology of the child. New York: Basic Books, 1969.

Resnick, L. B. Design of an early learning curriculum. Working Paper 16, 1969, Learning Research & Development Center, Univ. of Pittsburg.

Tyler, R. W., Gagne, R. M., & Scriven, M. Perspectives of curriculum evaluation. Chicago: Rand McNally, 1967.

Sources for Curriculum Activities

Barsch, R. H. Enriching perception and cognition: Techniques for teachers. Perceptual-Motor Curriculum, Vol. 2. Seattle: Special Child Publications, 1968.

Blackie, J. Inside the primary school. New York: British Information Services, 1967.

Brearley, M. (Ed.) The teaching of young children: Some applications of Piaget's learning theory. New York: Schocker Books, 1970.

Education Development Center, 55 Chapel St., Newton, Mass. 02160.
Pamphlets:
Messing about in science.
Children printing.
Building with cardboard.
Building with tubes.

Elementary Science Study, 55 Chapel St., Newton, Mass. 02160.
Teachers' Guides:
Light and shadows.
Match and measure.
Mirror cards.
Sink or float.
Starting from seeds.
Tangrams.
The balance book.

Hawkins, F. P. The logic of action: From a teacher's notebook. Univ. of Colorado: Mountain View Center for Environmental Education, 1969.

Hull, Wm. P. *Attribute games and problems: Teacher's guide.* New York: McGraw-Hill, Webster Division, 1968.

Karnes, M. B. *Helping young children develop language skills: A book of activities.* Arlington, Va.: Council for Exceptional Children, 1968.

Lavatelli, C. S. *Early childhood curriculum - A Piaget program: Teacher's guide.* Center for Media Development, American Science and Engineering, Inc., New York, 1970.

Leitman, A. *Science for deaf children.* Book V, Lexington School for the Deaf Education Series. Wash., D. C.: A. G. Bell Assoc. for the Deaf, 1968.

Marshall, J. S., Podendorf, I., & Swartz, C. *Sense & tell:* Teacher's guidebook. Glenville, Ill.: Scott, Foresman, 1968.

Nuffield Mathematics Project. New York: Wiley, 1968.
Beginnings:
I do and I understand.
Mathematics begins.
Pictorial representation.
Environmental geometry.

Palmer, F. H. Concept training curriculum for children aged two to three years and eight months. In *Early intellective training and later school performance.* Mimeo, 1968. (Institute for Child Development and Experimental Education, City University of New York, 33 W. 42 St., New York, N. Y. 10036.)

Ployer, F. & Arnow, N. *Pattern blocks: Teacher's guide.* New York: McGraw-Hill, Webster Div., 1970.

Portland Public Schools with Northwest Regional Educational Laboratory. *Improving motor-perceptual skills.* Corvallis, Oregon: Continuing Education Publications, 1970.

School District of University City. Univ. City, Mo., 1969.
Developmental skills series:
Motor activities: Booklet I.
Sensory experiences: Tactile, auditory, visual: Booklet II.
Activities for building concepts of logical thinking: Booklet III.

Sharp, E. Thinking is child's play. New York: E.P. Dutton, 1969.

South Euclid-Lyndhurst City Schools. A guide for perceptual-motor training activities in kindergarten. (1968). Cleveland, Ohio: Pupil Services (1250 Professor Rd.).

Thier, H. D. Material objects: Teacher's guide. San Francisco: Heath, 1966.

Tonjes, M. & Mavis, M. Thinkers: A manual of independent learning activities for kindergarten and grade one. (August, 1970). Albuquerque, N. M.: Southwestern Cooperative Educational Laboratory, Inc., (117 Richmond Drive, N.E.).

University of Georgia. Follow through mathemagenics activities program. Athens, Ga.: Research and Development Center in Educational Stimulation.

Hamrick, K. & Smith, W. E. Relations Workbook: Student's workbook for relations. April 1970.

Relations: Teacher's guide. August 1970.

McKillip, W. D.
- Counting: Student workbook. September 1969.
- Counting: September 1969.
- Matching: Teacher's guide. July 1969.
- Matching: Frog I workbook. Student's workbook for matching. July 1969.
- Matching: Frog II workbook. Student's workbook for matching. July 1969.
- Patterns: Teacher's guide. December 1969.
- Patterns: Student's workbook for patterns. December 1969.

Robinson, E. G. Shadow geometry project. June 1969.

Periodicals

Elementary Science Study Newsletter
Elementary Science Study
55 Chapel Street
Newton, Mass. 02160

Exceptional Children
Jefferson Plaza Suite 900
1411 S. Jefferson Davis Highway
Arlington, Va. 22202

Harvard Educational Review
Harvard Educational Review
Longfellow Hall
13 Appian Way
Cambridge, Mass. 02138

IMC Reports
New York State Education Department
Special Education Instructional Materials Center
800 N. Pearl Street
Albany, N.Y. 12204

Interchange
Ontario Institute for Studies in Education
252 Bloor Street W.
Toronto 5, Ontario
Canada

ORBIT
Ontario Institute for Studies in Education
252 Bloor Street W.
Toronto, 5, Ontario
Canada

SCIS Newsletter
Science Curriculum Improvement Study
Lawrence Hall of Science
Univ. of California
Berkeley, Calif. 94720

Young Children
National Association for the Education of Young Children
1834 Connecticut Ave., N.W.
Washington, D.C. 20009

Films

The following films are good introductions to the British Infant School ("open classroom"):

Children and Mathematics (5 reels) black and white

1. We still need arithmetic
2. Common sense and the new mathematics
3. Freedom to think
4. Checking up
5. Teacher at the centre.

Purchase from: B. B. C.
630 Fifth Avenue
New York, N. Y. 10020

Infants School (32 minutes, black & white)
Education Development Center
55 Chapel Street
Newton, Mass. 02160

They Can Do It (34 minutes, black & white)
Education Development Center
55 Chapel Street
Newton, Mass. 02160

I Am Here Today (43 minutes, black & white)
Education Development Center
55 Chapel Street
Newton, Mass. 02160

Piaget's Developmental Theory Series (2 reels, color)

1. Classification
2. Conservation

These films show "Piagetian interviews" conducted by Celia Stendler-Lavatelli, well-known psychologist, and Robert Karplus, a physicist-participant in the Science Curriculum Improvement Study. The interviews demonstrate the different approaches used by children at the pre-operational concrete-operational and formal-operational stages of conceptual development. Produced in 1967.

Davidson Films
1757 Union Street
San Francisco, Calif.

APPENDIX C

DEVELOPMENTAL EVALUATION RECORD

On the following page you will find the recommended format for recording an individual child's educational achievements, based on the educational objectives of the CREED Curriculum.

While we realize that this recording form will be implemented in different ways from school to school, it is our desire that it become an information source for prescriptive teaching purposes. Toward this end, we recommend that those who use it take into consideration the following:

1. The CREED Curriculum is based on a hypothesized sequence of development. There is a great deal of overlap between areas, e.g., a child may achieve certain objectives in Visual Analysis which are prerequisites for the mastery of a task in Conceptualization. Because of limitations of time and space, it is not possible to show this relationship in the curriculum. It will be necessary in the use of the recording form, however, to consider the interrelationships of the child's educational achievements from one area to another.

2. Individual differences among children dictate different sequences of acquiring information and mastering the various tasks. Because the sequencing of the objectives in the curriculum is hypothesized and because of differences in the experience and background of individual children the recording form sequence must not be used rigidly. To make sure that a child masters task 3 after task 2, etc., would be inimical to the general goals of the CREED 5 Curriculum. Rather it should be used as a guideline to the child's present abilities, and to those he has not yet accomplished and requires help in developing.

3. The most important part of the recording form is the section for comments. If it is to be of real value it is not sufficient to check the child's mastery of a particular objective. The comments should be made based on several observations of the child involved in several different types of activities designed to fulfill the educational objective.

The comments should be contributed by all school personnel who have interactions with the child: the supervisor and paraprofessional or classroom aide as well as the teacher.

We hope that the recording form will be useful as the basis for an ongoing evaluation and individualized prescriptive teaching program.

Sample - Developmental Evaluation Record

Visual Analysis	Dates of Observations	Beyond Level (1)	Occasional Mastery (2)	Mastered (3)	Comments
General Objective IX: To develop the ability to match printed forms"					
S.O. 1: To match single printed geometric figures					
S.O. 2: To match printed symbols:					
a. to match symbols with other symbols					
b. to match symbols with transformations of those symbols					
S.O. 3: To match sets of geometric figures					
S.O. 4: To match sets of printed symbols:					
a. to match sets of two-three symbols					
b. to match sets of four or more symbols					

(1) Beyond child's level of development at this time.
(2) Child masters tasks on some occasions and not on others.
(3) Child has succeeded in performing task on numerous occasions.